INSIGNIA™

# SERVICE MANUAL

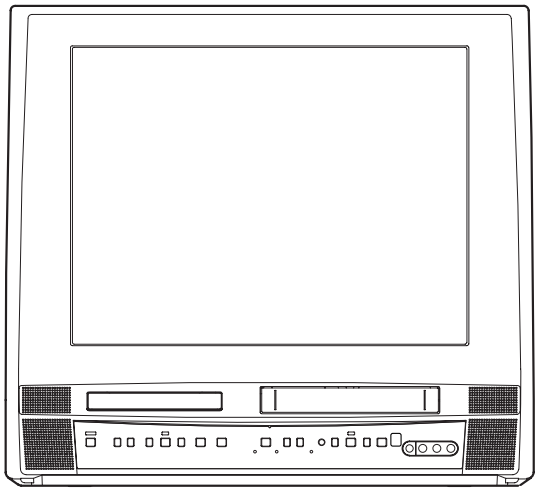
**Main Section**
- Specifications
- Preparation for Servicing
- Adjustment Procedures
- Schematic Diagrams
- CBA's
- Exploded Views
- Parts List

**When servicing the deck mechanism, refer to MK14 Deck Mechanism Section.**

**Deck Mechanism Part No.: N2466FT**

## 20″ ANALOG/DIGITAL PURE FLAT COLOR TV/DVD/VCR

## NS-F20TR



VHS

**Manufactured for Insignia Products**

**Distributed by Best Buy Co., Inc.**

**7601 Penn Ave S.Richfield, MN 55423 USA**

# IMPORTANT SAFETY NOTICE

**Proper service and repair is important to the safe, reliable operation of all Best Buy Equipment. The service procedures recommended by Best Buy and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.**

**It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Best Buy could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Best Buy has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Best Buy must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.**

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# MAIN SECTION

# 20″ ANALOG/DIGITAL PURE FLAT COLOR TV/DVD/VCR

# NS-F20TR

**Main Section**
- **Specifications**
- **Preparation for Servicing**
- **Adjustment Procedures**
- **Schematic Diagrams**
- **CBA's**
- **Exploded Views**
- **Parts List**

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# SPECIFICATIONS

✳ Mode---------SP mode unless otherwise specified

✳ Test input terminal
<Except Tuner>--------Video input (1 Vp-p)
Audio input (-10 dB)
<Tuner>----------Ant. input (80 dBμV) Video: 87.5%
Audio: 25 kHz dev. (1 kHz Sin)

## < DEFLECTION >

| Description | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|
| 1. Over Scan | Horizontal | % | 90 | ±5 |
| | Vertical | % | 90/88 | ±5 |
| 2. Linearity | Horizontal | % | 0 | ±18 |
| | Vertical | % | 0 | ±10 |
| 3. High Voltage | --- | kV | 25.5 | +3/-7 |

## < VIDEO & CHROMA >

| Description | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|
| 1. Misconvergence | Center | m/m | 0 | 0.4 |
| | Corner | m/m | 0 | 2.5 |
| | Side | m/m | 0 | 1.5 |
| 2. Tint Control Range | --- | deg | ±30 | >+23/<-23 |
| 3. Contrast Control Range | --- | dB | 6 | 2 |
| 4. Brightness (100% White Full Field) | Contrast: Max | ft-L | 28 | 24 |
| 5. Color Temperature | --- | K | 9200 | --- |

## < DVD > Measurement at Loader PCB CN2-3pin, 4pin (Audio) and Loader PCB CN2-6pin, 8pin (Video)

| Description | | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|---|
| 1. Horizontal Resolution (TDV-540 TIT.2 CHP.16) | | --- | Line | 350 | 330 |
| 2. Video S/N (TDV-540 TIT.2 CHP.6) | | --- | dB | 60 | 55 |
| 3. S/N Chroma (TDV-540 TIT.2 CHP.17) | AM | --- | dB | 58 | 53 |
| | PM | --- | dB | 58 | 53 |
| 4. Audio Distortion (LPCM 48 kHz, W/LPF) (PTD 1-NOR TIT.1 CHP.1) | | L<br>R | % | 0.03 | 0.07 |
| 5. Audio freq. Response (LPCM 48 kHz) (PTD 1-NOR TIT.1 CHP.1, 5, 10) | | L, 20 Hz<br>R, 20 Hz<br>L, 20 kHz<br>R, 20 kHz | dB | 0 | +4/-5 |
| 6. Audio S/N (LPCM 48 kHz,W/LPF,A-WTD) (PTD 1-NOR TIT.1 CHP.1, 2) | | L<br>R | dB | 85 | 75 |

## < TUNER > Measurement at Speaker (Audio), TP1401 (Video)

| Description | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|
| 1. Video S/N (80 dBμV, TV4ch) | --- | dB | 45 | 40 |
| 2. Audio S/N (W/LPF, 15 kHz dev.) | --- | dB | 45 | 40 |

## < VCR > Measurement at TP1401 (Video)

| Description | | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|---|
| 1. Horizontal Resolution | | (R/P, SP) | Line | 230 | 200 |
| 2. Jitter (Low) | | (R/P, SP) | μs | 0.1 | 0.2 |
| 3. S/N Chroma | AM | (R/P, SP) | dB | 38 | 33 |
| | PM | (R/P, SP) | dB | 38 | 33 |
| 4. Wow & Fiutter (JIS, UNWTD) | | (R/P, SP) | % | 0.25 | 0.5 |

## < VCR NORMAL AUDIO>

All items are measured across 8 Ω resistor at speaker output terminal.

| Description | | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|---|
| 1. Audio Output Power | | (R/P, SP) | W | 1.0 | 0.8 |
| 2. Audio S/N (W/LPF) | | (R/P, SP) | dB | 40 | 36 |
| 3. Audio distortion (W/LPF, -10 dB 1 kHz IN) | | (R/P, SP) | % | 3.0 | 5.0 |
| 4. Audio Freq. Response (-20dB 1kHz IN) | 200 Hz | (R/P, SP) | dB | -2.0 | -2.0±5.0 |
| | 8 kHz | (R/P, SP) | dB | 0 | 0±6.0 |

## < VCR Hi-Fi AUDIO >

| Description | | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|---|
| 1. Output Level (-10 dB 1 kHz IN) | | (R/P, SP) | dB | -8.0 | -8±4 |
| 2. Audio Distortion (-10 dB 1 kHz IN) | | (R/P, SP) | % | 0.5 | 1.0 |
| 3. Freq. Response (-15 dB 1 kHz IN) | 20 Hz | (R/P, SP) | dB | 0 | ±4 |
| | 20 kHz | (R/P, SP) | dB | 0 | ±4 |

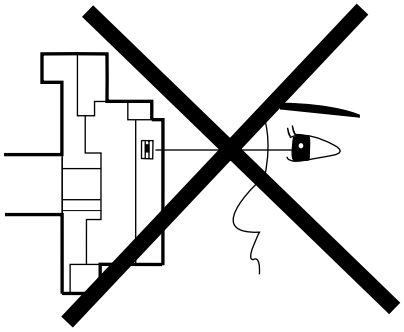
## < ATSC > Measurement at Speaker (Audio)

| Description | Condition | Unit | Nominal | Limit |
|---|---|---|---|---|
| 1. RECEIVED FREQ. RANGE (-28dBm) | + | kHz | 150 | >100 |
| | – | kHz | 150 | >100 |
| 2. ATSC DYNAMIC RANGE (min./max.) | | | | |
| VHF LOW BAND. CH.4 | --- | dBμV | 26/114 | 32/108 |
| VHF HI BAND. CH.10 | | dBμV | 26/114 | 32/108 |
| UHF BAND. CH.41 | | dBμV | 28/118 | 34/112 |
| 3. ATSC SUSCEPTIBILITY TO RANDOM NOISE | | | | |
| VHF LOW BAND. CH.4 | --- | dB | 20 | <26 |
| VHF HI BAND. CH.10 | | dB | 20 | <26 |
| UHF BAND. CH.41 | | dB | 20 | <26 |
| 4. NTSC CO-CHANNEL INTERFERENCE | | | | |
| VHF LOW BAND. CH.4 | --- | dB | 0 | >-6 |
| VHF HI BAND. CH.10 | | dB | 0 | >-6 |
| UHF BAND. CH.41 | | dB | 0 | >-6 |
| 5. MULTIPATH | A | dB | 0 | <6 |
| | B | dB | 0 | <6 |
| | C | dB | 0 | <6 |
| | D | dB | 0 | <6 |
| | E | dB | 0 | <6 |
| | F | dB | 0 | <6 |
| | FF | dB | 0 | <6 |
| | G | dB | 0 | <6 |
| 6. Audio S/N (0dBfs) | L | dB | 60 | >50 |
| | R | dB | 60 | >50 |
| 7. Audio DIST. (0dBfs) | L | % | 0.1 | <3 |
| | R | % | 0.1 | <3 |

**Note:** Nominal specifications represent the design specifications. All units should be able to approximate these. Some will exceed and some may drop slightly below these specifications. Limit specifications represent the absolute worst condition that still might be considered acceptable. In no case should a unit fail to meet limit specifications.

# LASER BEAM SAFETY PRECAUTIONS

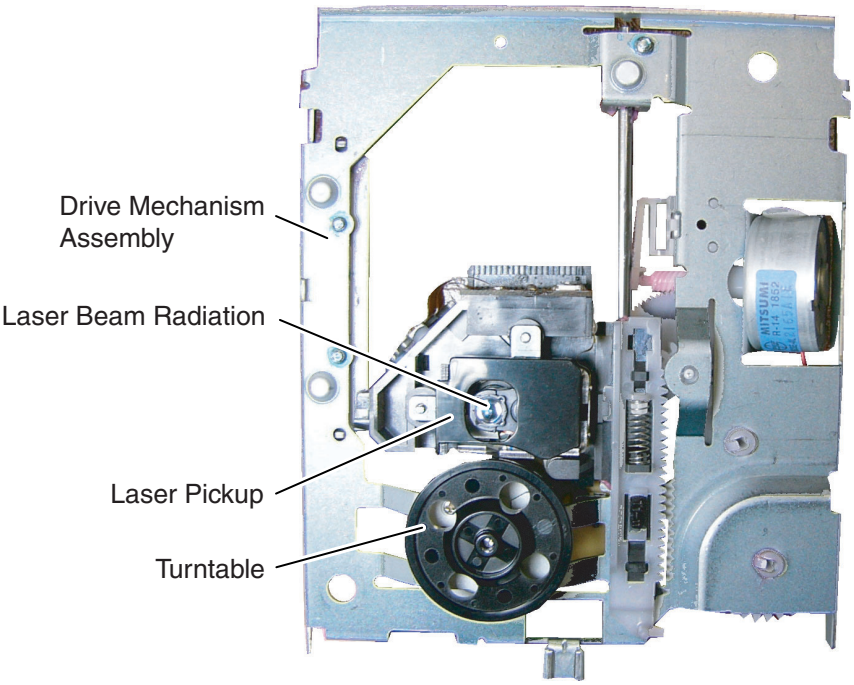
This DVD player uses a pickup that emits a laser beam.



**Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.**

The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 30 cm away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.

**CAUTION:** Use of controls and adjustments, or doing procedures other than those specified herein, may result in hazardous radiation exposure.




CAUTION
LASER RADIATION
WHEN OPEN. DO NOT
STARE INTO BEAM.

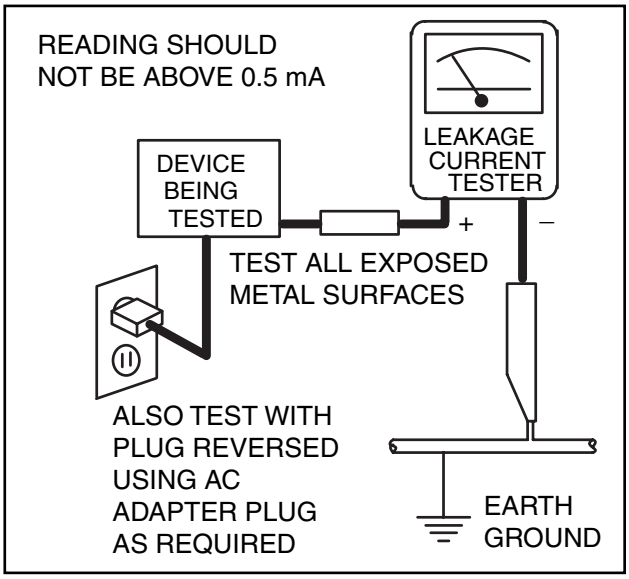
**Location: Top of DVD mechanism.**

# IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected for recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

## Safety Precautions for TV Circuit

1. **Before returning an instrument to the customer,** always make a safety check of the entire instrument, including, but not limited to, the following items:
   - **a.** Be sure that no built-in protective devices are defective and have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**
   - **b.** Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.
   - **c. Antenna Cold Check -** With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.
   - **d. Leakage Current Hot Check -** With the instrument completely reassembled, plug the AC line cord directly into a 120 V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milli-ampere. Reverse the instrument power cord plug in the outlet and repeat the test.




**ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.**

- **e. X-Radiation and High Voltage Limits -** Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original.

Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place. High voltage must be measured each time servicing is performed that involves B+, horizontal deflection or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called “horizontal disable” or “hold down.”) Read and apply the high voltage limits and, if the chassis is so equipped, the X-radiation protection circuit specifications given on instrument labels and in the Product Safety & X-Radiation Warning note on the service data chassis schematic. High voltage is maintained within specified limits by close tolerance safety-related components/ adjustments in the high-voltage circuit. If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.
3. **Design Alteration Warning -** Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.
4. **Picture Tube Implosion Protection Warning -** The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some “in-line” picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do not try to remove such “permanently attached” yokes from the picture tube.
5. **Hot Chassis Warning -**
   a. Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and maybe safety-serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter, measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground.
   b. Some TV receiver chassis normally have 85V AC(RMS) between chassis and earth ground regardless of the AC plug polarity. This chassis can be safety-serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection.
   c. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulation material that must not be defeated or altered.
6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: a. near sharp edges, b. near thermally hot parts-be sure that leads and components do not touch thermally hot parts, c. the AC supply, d. high voltage, and, e. antenna wiring. Always inspect in all areas for pinched, out of place, or frayed wiring. Check AC power cord for damage.
7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.
8. **Product Safety Notice -** Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a ⚠ on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The product's safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are strictly inspected to confirm they comply with the recognized product safety and electrical codes

of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

## Precautions during Servicing

**A.** Parts identified by the ⚠ symbol are critical for safety.
Replace only with part number specified.

**B.** In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

**C.** Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

**D.** Use specified insulating materials for hazardous live parts. Note especially:
1) Insulation Tape
2) PVC tubing
3) Spacers
4) Insulators for transistors.

**E.** When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

**F.** Observe that the wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.)

**G.** Check that replaced wires do not contact sharp edged or pointed parts.

**H.** When a power cord has been replaced, check that 5~6 kg of force in any direction will not loosen it.

**I.** Also check areas surrounding repaired locations.

**J.** Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

**K.** Crimp type wire connector
When replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, in order to prevent shock hazards, perform carefully and precisely the following steps.
Replacement procedure
1) Remove the old connector by cutting the wires at a point close to the connector.
Important: Do not re-use a connector (discard it).
2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
4) Use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

**L.** When connecting or disconnecting the DVD/VCR connectors, first, disconnect the AC plug from the AC supply socket.

# Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

## 1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

**Table 1: Ratings for selected area**

| AC Line Voltage | Region | Clearance Distance (d), (d') |
|---|---|---|
| 110 to 130 V | U.S.A. or Canada | ≥ 3.2 mm (0.126 inches) |

**Note:** This table is unofficial and for reference only. Be sure to confirm the precise values.

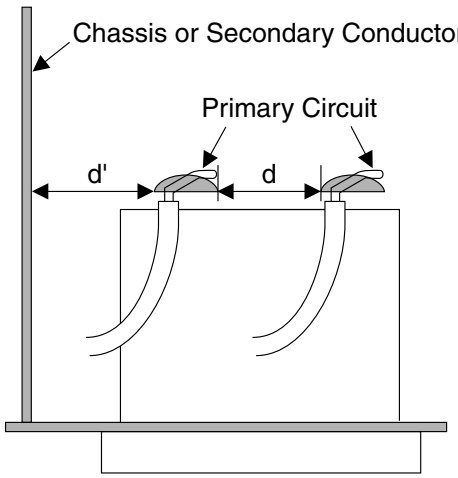



**Fig. 1**

## 2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

**Measuring Method: (Power ON)**

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Fig. 2 and following table.

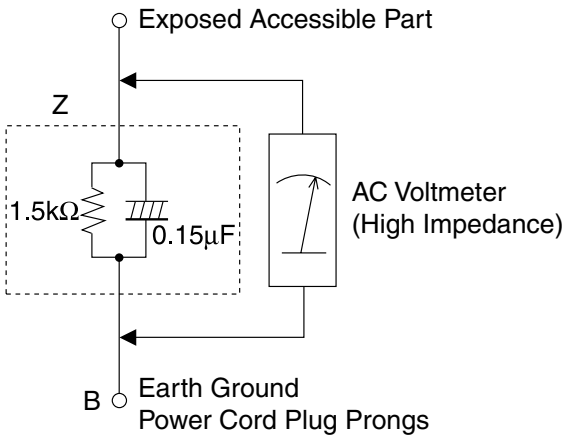



**Fig. 2**

**Table 2: Leakage current ratings for selected areas**

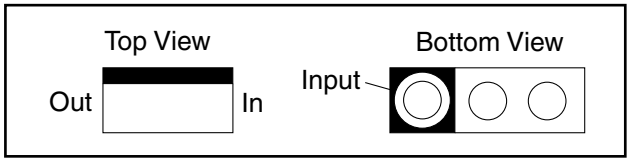
| AC Line Voltage | Region | Load Z | Leakage Current (i) | Earth Ground (B) to: |
|---|---|---|---|---|
| 110 to 130 V | U.S.A. or Canada | 0.15 μF CAP. & 1.5 kΩ RES. Connected in parallel | i ≤ 0.5 mA rms | Exposed accessible parts |

**Note:** This table is unofficial and for reference only. Be sure to confirm the precise values.

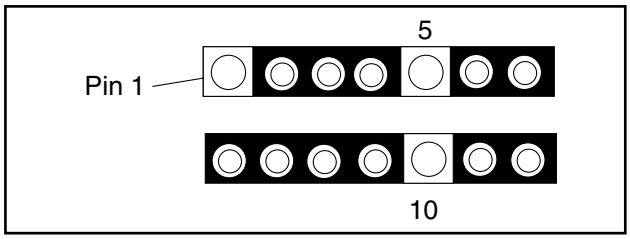
# STANDARD NOTES FOR SERVICING

## Circuit Board Indications

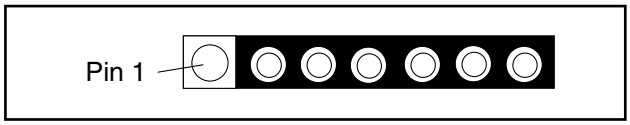
1. The output pin of the 3 pin Regulator ICs is indicated as shown.




2. For other ICs, pin 1 and every fifth pin are indicated as shown.

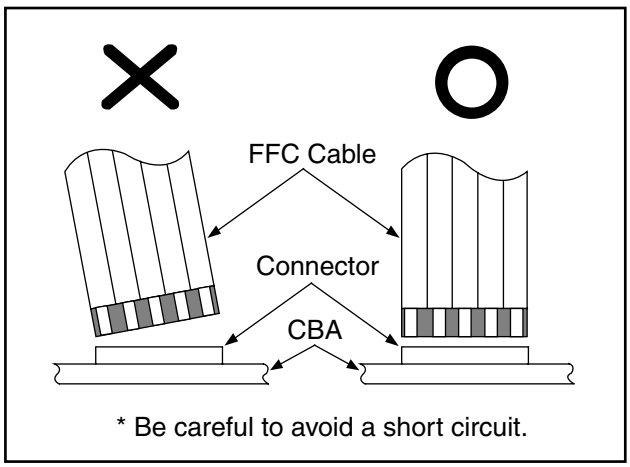



3. The 1st pin of every male connector is indicated as shown.



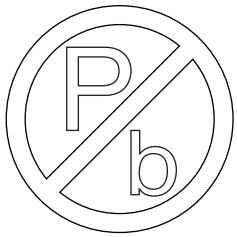

## Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.




## Pb (Lead) Free Solder

**Pb free mark will be found on PCBs which use Pb free solder. (Refer to figure.) For PCBs with Pb free mark, be sure to use Pb free solder. For PCBs without Pb free mark, use standard solder.**




Pb free mark

## How to Remove / Install Flat Pack-IC

### 1. Removal

**With Hot-Air Flat Pack-IC Desoldering Machine:**

1. Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

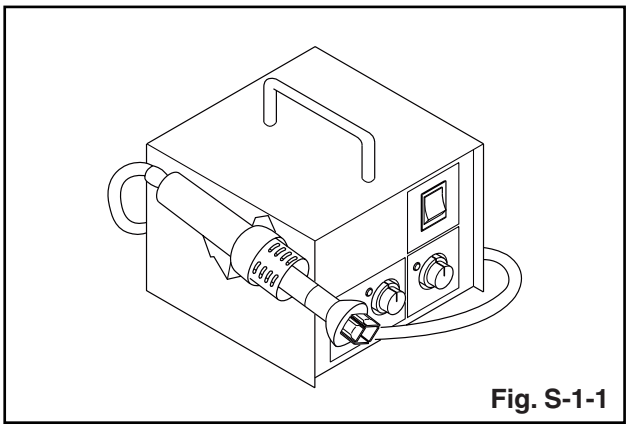


**Fig. S-1-1**

2. Remove the flat pack-IC with tweezers while applying the hot air.
3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

**CAUTION:**

1. The Flat Pack-IC shape may differ by models. Use an appropriate hot-air flat pack-IC desoldering machine, whose shape matches that of the Flat Pack-IC.
2. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape

around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)

3. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

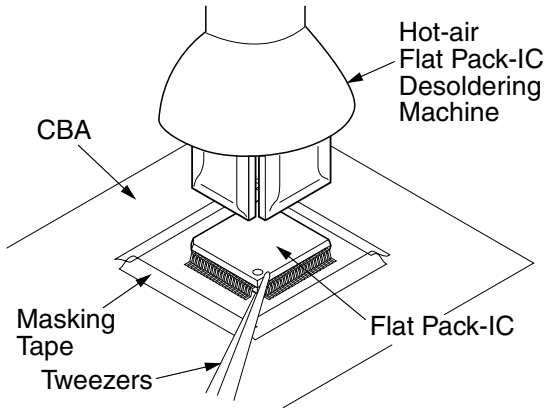



**Fig. S-1-2**

**With Soldering Iron:**

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

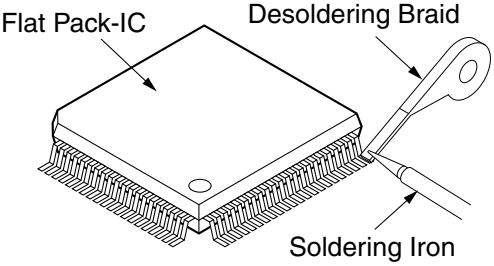



**Fig. S-1-3**

2. Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

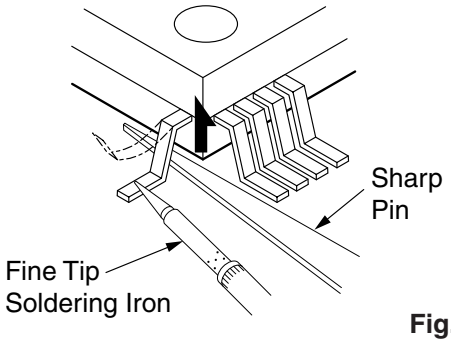



**Fig. S-1-4**

3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

**With Iron Wire:**

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5.
4. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
5. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

**Note:** When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.

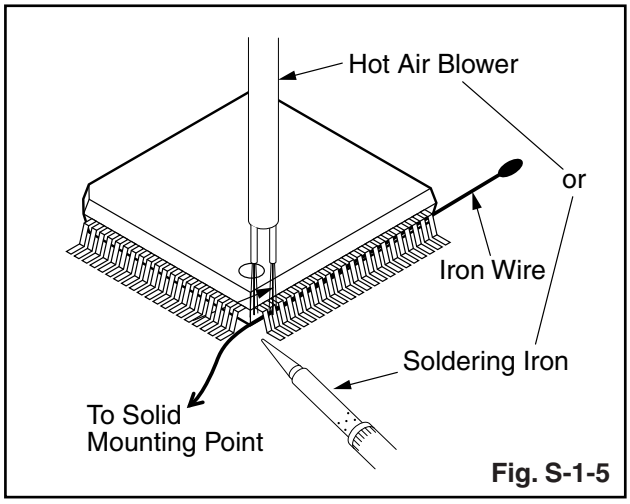



**Fig. S-1-5**

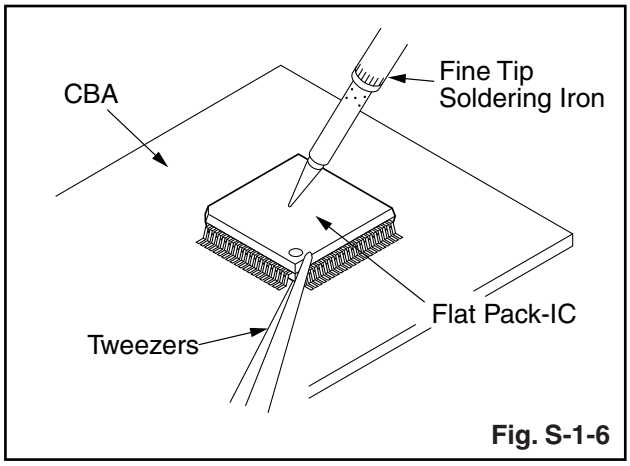



**Fig. S-1-6**

## 2. Installation

1. Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.
2. The "●" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. S-1-8.)
3. Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

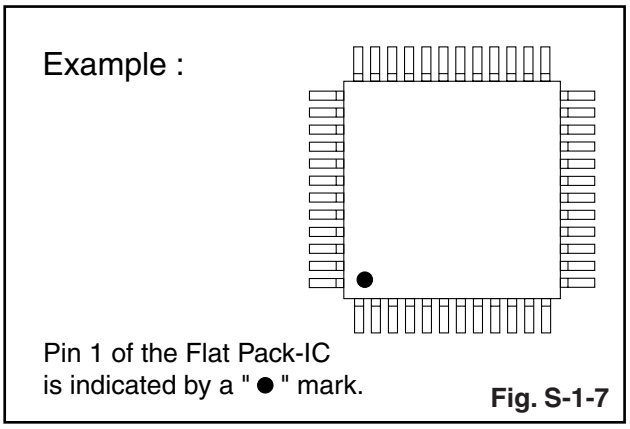



**Fig. S-1-7**

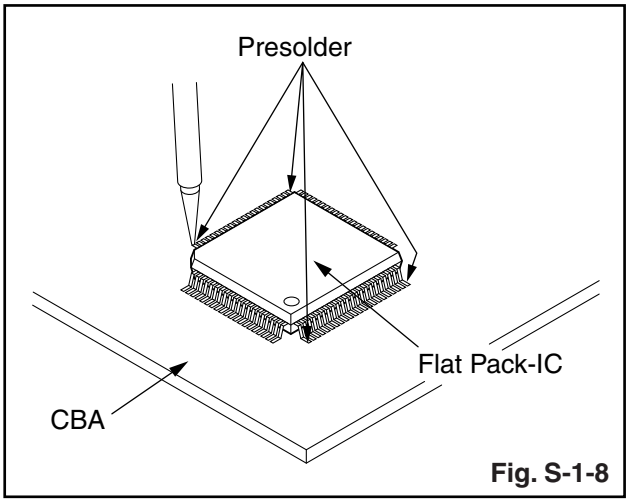



**Fig. S-1-8**

# Instructions for Handling Semi-conductors

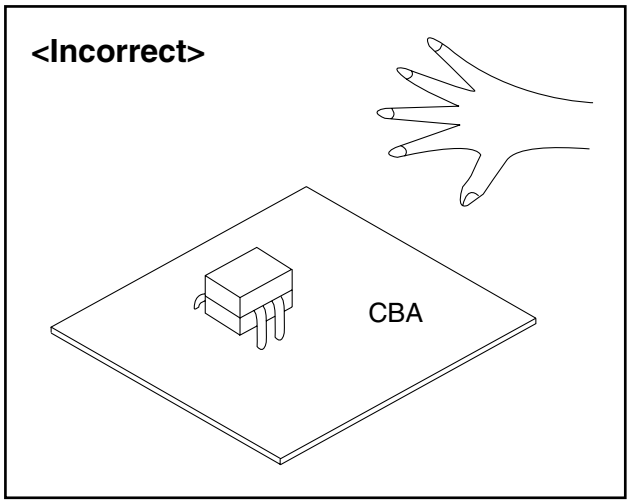
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

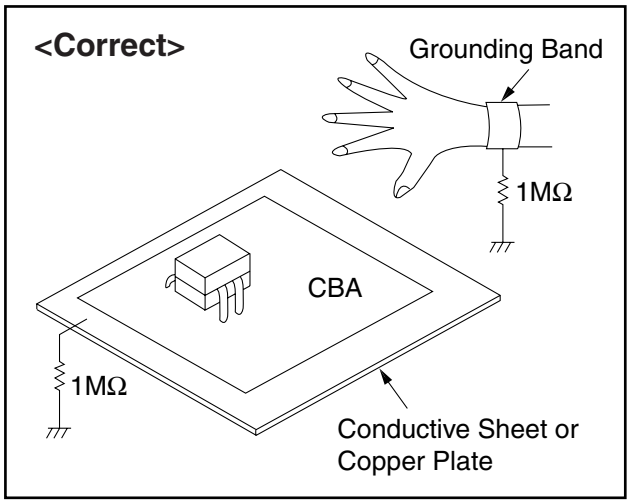
## 1. Ground for Human Body

Be sure to wear a grounding band (1 MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

## 2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding (1 MΩ) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.



# PREPARATION FOR SERVICING

## How to Enter Service Mode

**Caution 1:**

1. Optical sensors system are used for Tape Start and End Sensor on this equipment. Read this page carefully and prepare as described on this page before starting to service; otherwise, the unit may operate unexpectedly.

### Preparing 1:

1. Cover Q1202 (START SENSOR) and Q1201 (END SENSOR) with Insulation Tape or enter the service mode to activate Sensor Inhibition automatically.

**Note:** Avoid playing, rewinding or fast forwarding the tape to its beginning or end, because both Tape End Sensors are not active.

### How to Enter the Service Mode

1. Turn the power on.
2. Use the service remote control unit and Press the service button.
3. When entering the service mode, one of the number (1, 2 or 4) will be displayed at corners of the screen.
4. During Service mode, electrical adjustment mode can be selected by the service remote control unit key.

   Details are as follows.

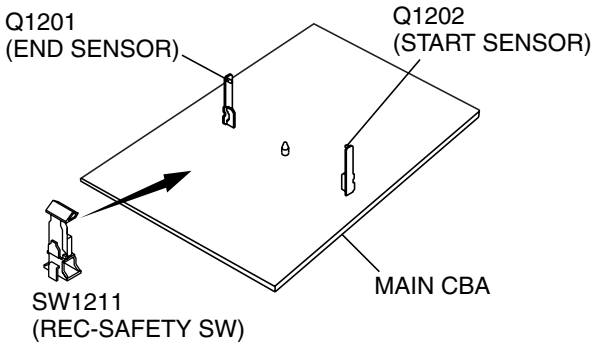
| Key | Adjustment Mode |
|---|---|
| **PICTURE** | Picture adjustment mode in TV mode or DTV mode:<br>Press the [PICTURE] button to change from BRT (Bright), *CNT (Contrast), *COL (Color), *TNT(Tint), *V-T(V-Tint) and *SHP (Sharpness). Press [CH. ▲/▼] buttons to display Initial Value.<br>*Marked items are not necessary to adjust normally. |
| **0** | C-Trap adjustment mode in TV mode:<br>See adjustment instructions. |
| **1** | No need to use. |
| **2** | H $f_0$ adjustment mode:<br>See adjustment instructions. |
| **3** | U-/V-Pedestal adjustment mode in DTV mode:<br>See adjustment instructions. |
| **4** | Auto record mode:<br>Perform recording (15 Sec.) --> Stop --> Rewind (Zero return) automatically. |
| **5** | Head switching position adjustment:<br>See adjustment instructions. |
| **6** | YUV Brightness up adjustment mode in DTV mode:<br>See adjustment instructions. |
| **7** | Purity check mode:<br>Shows Red, Green, Blue or White cyclically on the screen each time the [7] button is pressed. |
| **8** | H. Position adjustment:<br>See adjustment instructions. |
| **9** | V. Position/V. Size adjustment:<br>See adjustment instructions. |
| **VOL △** | No need to use. |
| **VOL ▽** | Cut-off/Drive adjustment:<br>See adjustment instructions.<br>White balance adjustment:<br>See adjustment instructions. |

**Caution 2:**

1. The deck mechanism assembly is mounted on the Main CBA directly, and SW1211 (REC-SAFETY SW) is mounted on the Main CBA. When deck mechanism assembly is removed from the Main CBA due to servicing, this switch can not be operated automatically.

### Preparing 2:

1. To eject the tape, press the [STOP/EJECT] button on the unit (or remote control).
2. When you want to record during Service mode, press the [REC] button while depressing SW1211 (REC-SAFETY SW) on the Main CBA.



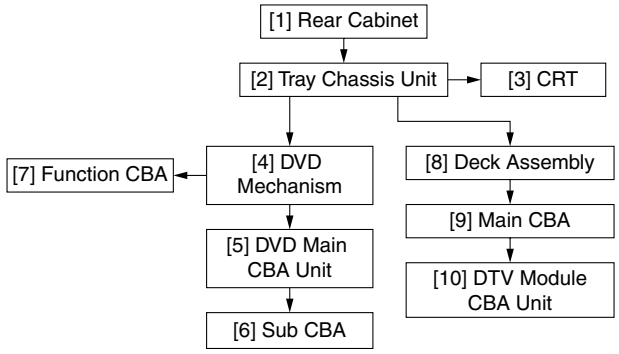
# CABINET DISASSEMBLY INSTRUCTIONS

## 1. Disassembly Flowchart

This flowchart indicates the disassembly steps for the cabinet parts, and the CBA in order to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route and dress the cables as they were.

### CAUTION!

When removing the CRT, be sure to discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.




## 2. Disassembly Method

| Step/ Loc. No. | Part | Removal | | |
|---|---|---|---|---|
| | | Fig. No. | Remove/*Unhook/ Unlock/Release/ Unplug/Unclamp/ Desolder | Note |
| [1] | Rear Cabinet | D1 | 4(S-1), (S-2), (S-3A), (S-3B) | --- |
| [2] | Tray Chassis Unit | D2 D3 D5 | Anode Cap, *CN2501, CRT CBA, *CN1601, *CN2571, *CN3801, *CN3802 | 1 |
| [3] | CRT | D3 | 4(S-4) | --- |
| [4] | DVD Mechanism | D2 D4 D5 | 4(S-5), *CN201, *CN301 | 2, 3 |
| [5] | DVD Main CBA Unit | D2 D4 D5 | *CN1, *CN2 | --- |
| [6] | Sub CBA | D2 D5 | 6(S-6), *CN1103, *CN1301, *CN1302 | --- |
| [7] | Function CBA | D2 D5 | (S-7), *CN2401 | --- |
| [8] | Deck Assembly | D2 D5 | 3(S-8), Top Shield, 7(S-9), (S-10), (S-11), *CL1201, *CL1401, *CL1402, *CL1403 | 4 |
| [9] | Main CBA | D2 D5 | 4(S-12) | --- |
| [10] | DTV Module CBA Unit | D2 D5 | *CN1101, *CN1102 Module PCB Holder | --- |
| ↓ (1) | ↓ (2) | ↓ (3) | ↓ (4) | ↓ (5) |

**Note:**

(1) Order of steps in procedure. When reassembling, follow the steps in reverse order. These numbers are also used as the Identification (location) No. of parts in figures.

(2) Parts to be removed or installed.

(3) Fig. No. showing procedure of part location

(4) Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P = Spring, L = Locking Tab, S = Screw,
CN = Connector
* = Unhook, Unlock, Release, Unplug, or Desolder
e.g. 2(S-2) = two Screws (S-2),
2(L-2) = two Locking Tabs (L-2)

(5) Refer to the following “Reference Notes in the Table”.

## Reference Notes in the Table

**CAUTION!**

When removing the CRT, be sure to discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.

1. **CAUTION 1:** Discharge the Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.

   Disconnect the following: Anode Cap, CN2501, CRT CBA, CN1601, CN2571, CN3801 and CN3802. Then remove Tray Chassis Unit.
2. **CAUTION 2:** Electrostatic breakdown of the laser diode in the optical system block may occur as a potential difference caused by electrostatic charge accumulated on cloth, human body etc., during unpacking or repair work.

   To avoid damage of pickup follow the next procedures.
   1) Disconnect Connector (CN301) on the DVD Main CBA Unit.
   2) Short the three short lands of the FPC cable with solder before removing the FFC cable (CN201). If you disconnect the FFC cable (CN201) without shorting them, the laser diode of pickup will be destroyed. (Fig. D4)
   3) Remove DVD Mechanism.
3. **CAUTION 3:** When reassembling, confirm the FFC cable (CN201) is connected completely. Then remove the solder from the three short lands of the FPC cable. (Fig. D4)
4. Remove screws 3(S-8) and remove Top Shield. Remove screws 7(S-9), (S-10) and (S-11). Then, desolder connectors (CL1201, CL1401, CL1402, CL1403) and lift up the Deck Assembly.

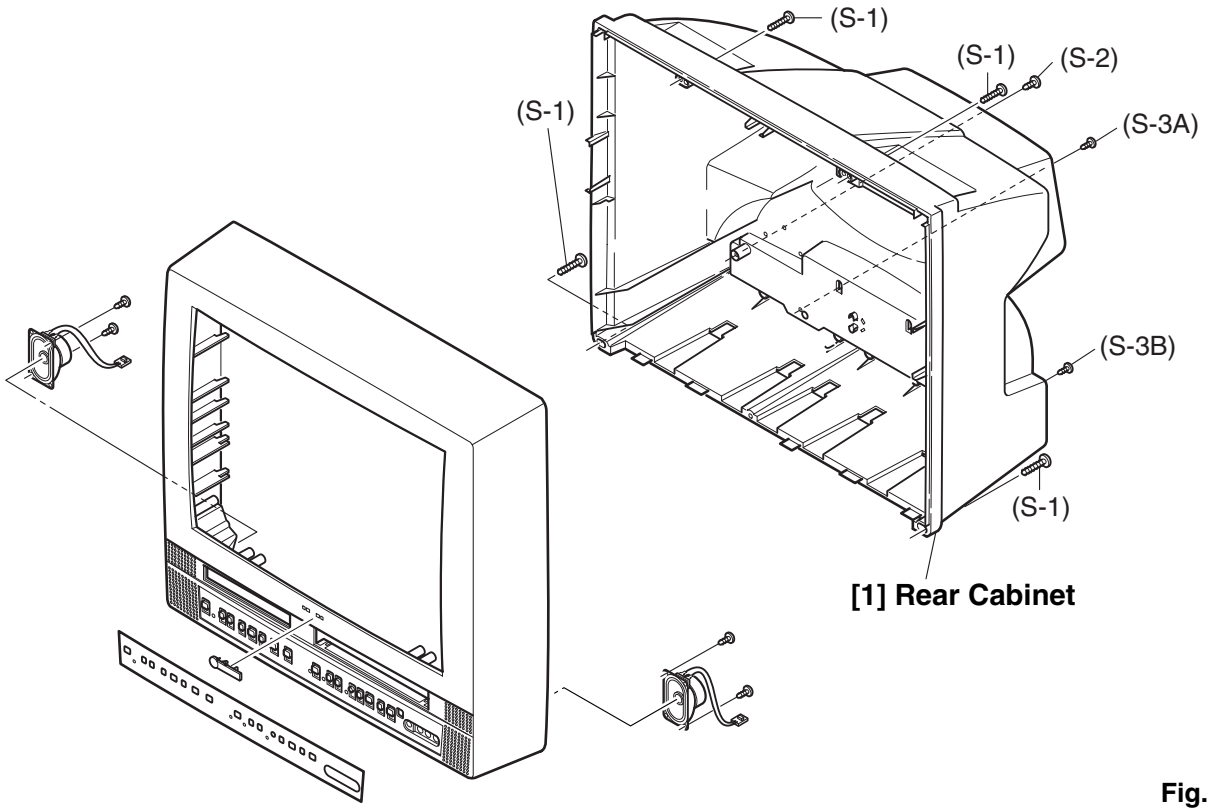



**Fig. D1**

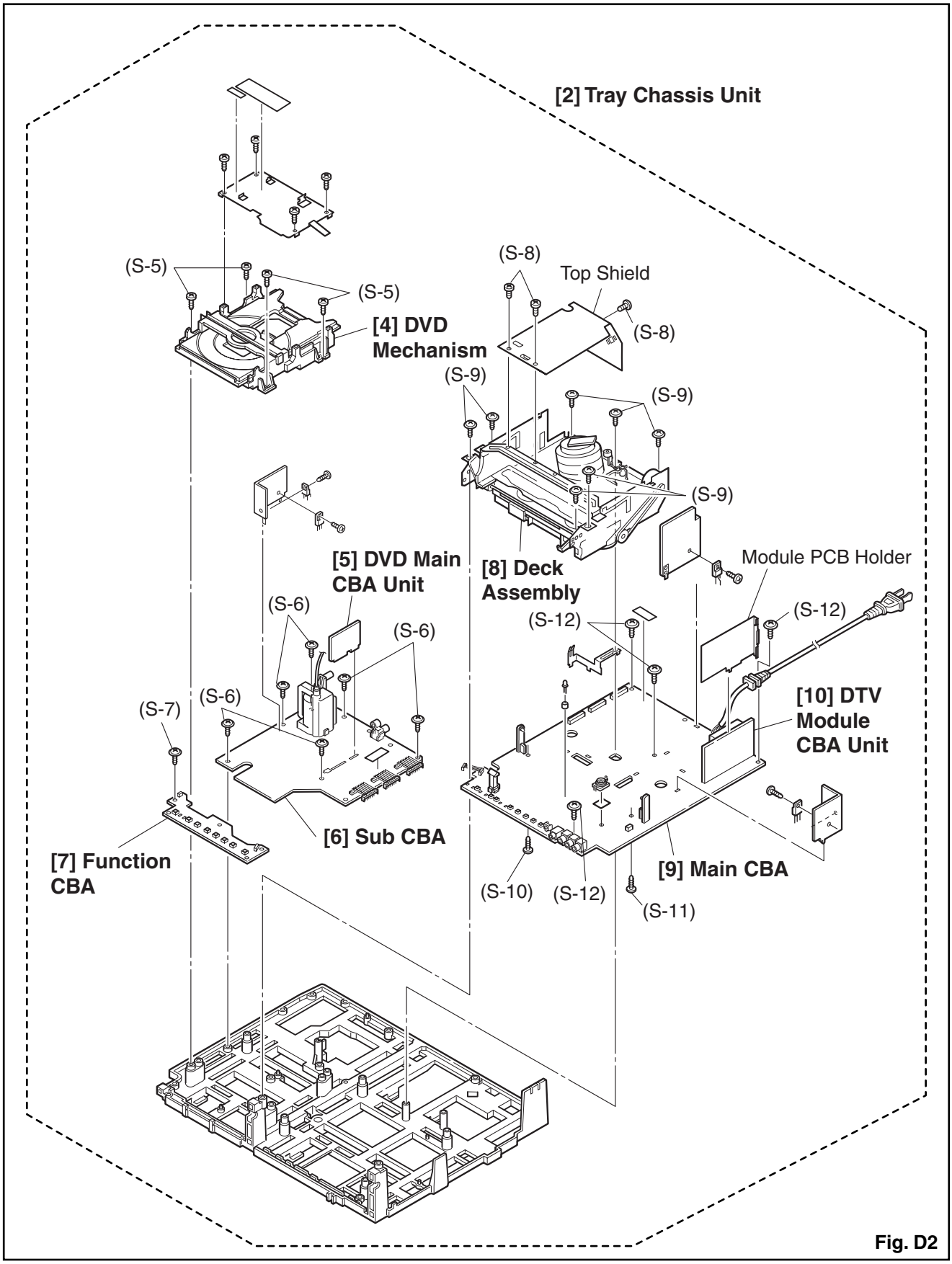

[2] Tray Chassis Unit
(S-5)
(S-5)
[4] DVD Mechanism
(S-8)
Top Shield
(S-8)
(S-9)
(S-9)
(S-9)
[5] DVD Main CBA Unit
[8] Deck Assembly
Module PCB Holder
(S-6)
(S-6)
(S-6)
(S-12)
(S-12)
(S-7)
[10] DTV Module CBA Unit
[6] Sub CBA
[7] Function CBA
[9] Main CBA
(S-10)
(S-12)
(S-11)

**Fig. D2**

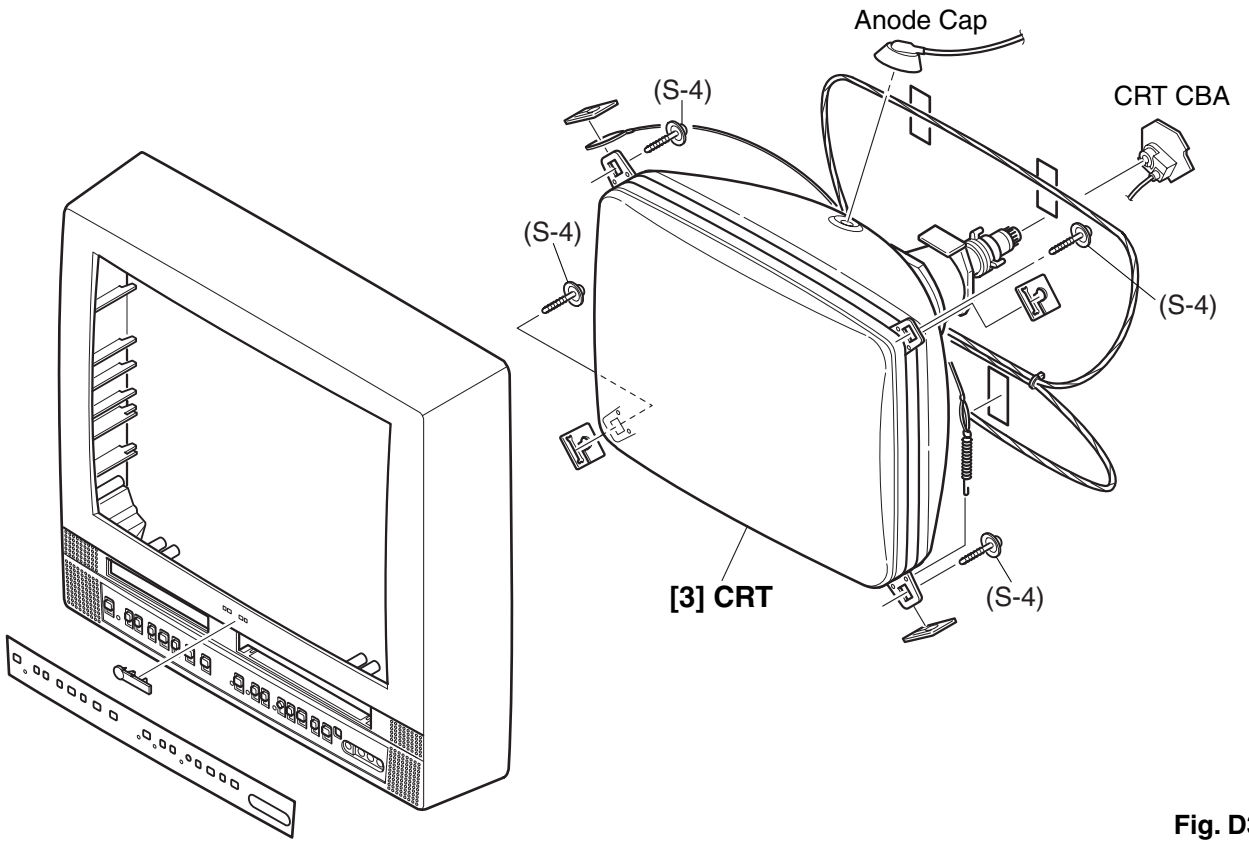
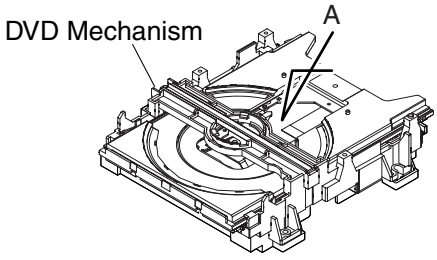

Anode Cap
(S-4)
CRT CBA
(S-4)
(S-4)
[3] CRT
(S-4)

**Fig. D3**


DVD Mechanism
A

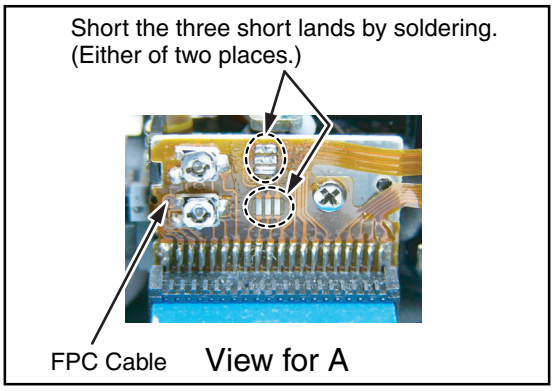

Short the three short lands by soldering.
(Either of two places.)
FPC Cable
View for A

**Fig. D4**

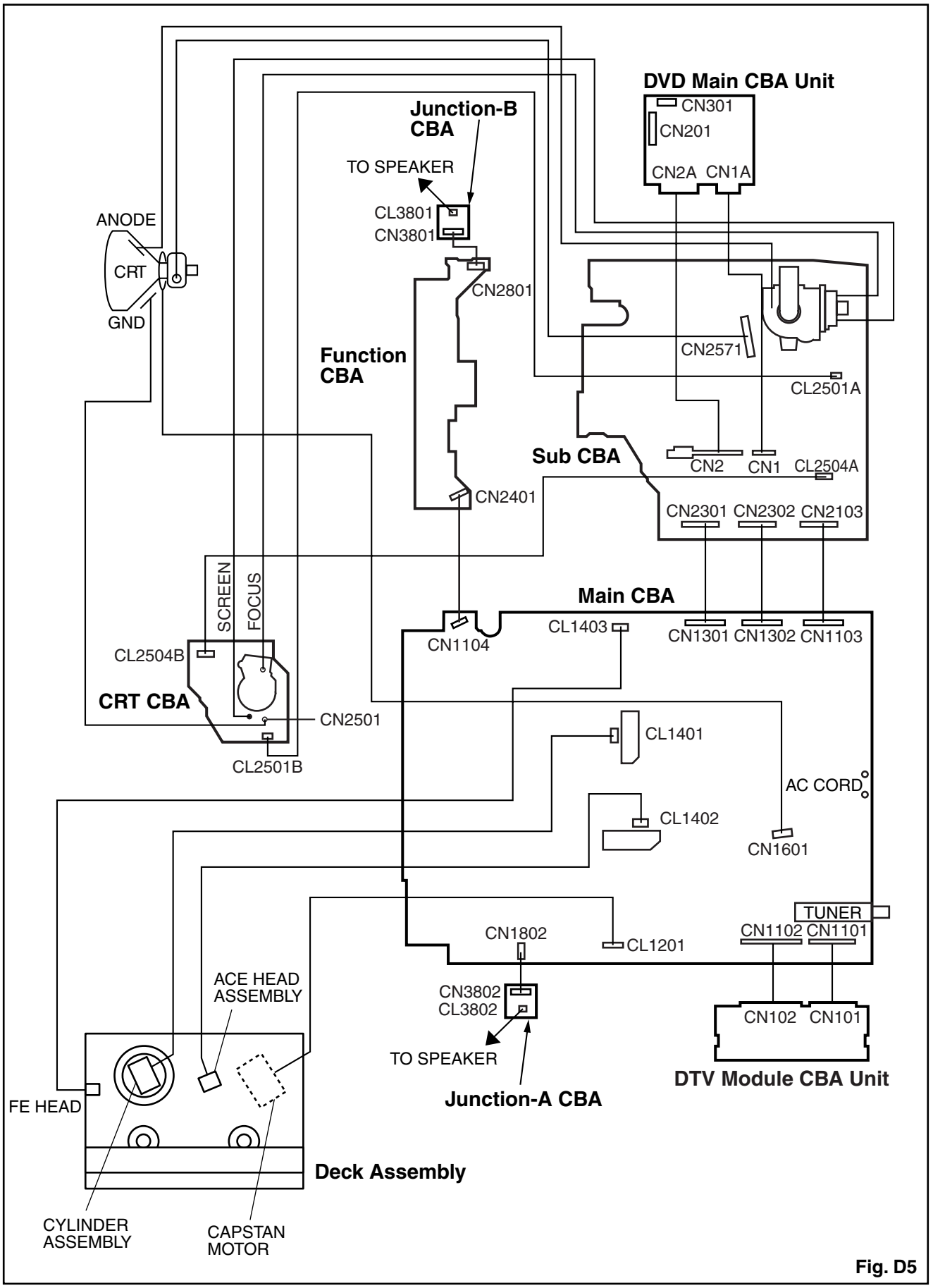

DVD Main CBA Unit
CN301
CN201
CN2A CN1A
Junction-B CBA
TO SPEAKER
CL3801
CN3801
ANODE
CRT
GND
CN2801
Function CBA
CN2571
CL2501A
Sub CBA
CN2
CN1
CL2504A
CN2401
CN2301 CN2302 CN2103
SCREEN
FOCUS
Main CBA
CN1104
CL1403
CN1301 CN1302 CN1103
CL2504B
CRT CBA
CN2501
CL2501B
CL1401
AC CORD
CL1402
CN1601
TUNER
CN1802
CL1201
CN1102 CN1101
ACE HEAD ASSEMBLY
CN3802
CL3802
TO SPEAKER
Junction-A CBA
CN102 CN101
DTV Module CBA Unit
FE HEAD
Deck Assembly
CYLINDER ASSEMBLY
CAPSTAN MOTOR

Fig. D5

# ELECTRICAL ADJUSTMENT INSTRUCTIONS

### General Note: "CBA" is abbreviation for "Circuit Board Assembly."

**Note:** Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed.
Also, do not attempt these adjustments unless the proper equipment is available.

## Test Equipment Required

1. NTSC Pattern Generator (Color Bar W/White Window, Red Color, Dot Pattern, Gray Scale, Monoscope, Multi-Burst)
2. AC Milli Voltmeter (RMS)
3. Alignment Tape (FL8A, FL8N), Blank Tape
4. DC Voltmeter
5. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50 V/Div,
   F-Range: DC~AC-60 MHz
6. Frequency Counter
7. Plastic Tip Driver
8. Color Analyzer

## How to make the service remote control unit:

Cut "A" portion of the attached remote control unit as shown in Fig. 1.

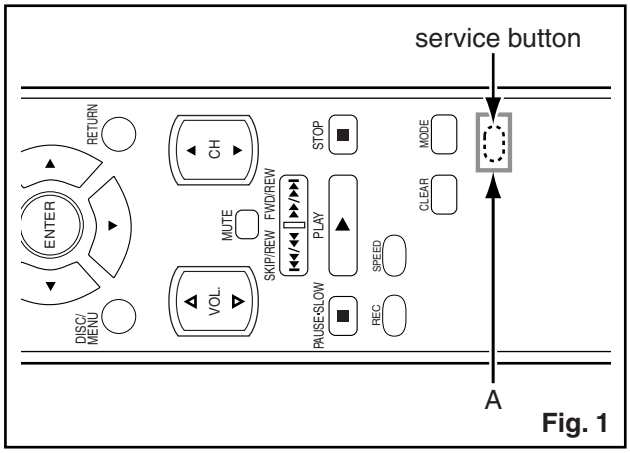



**Fig. 1**

## How to enter Service mode:

### Service mode:

1. Use the service remote control unit.
2. Turn the power on. (Use main power on the TV unit.)
3. To change TV mode, DTV mode, or DVD mode, press [SELECT] button on the TV unit.
4. Press the service button on the service remote control unit as shown in Fig. 1.

## X-Ray Protection Test

X-Ray protection test should be done when replacing any parts of this chassis.

1. Short both ends of R2592 (on Sub CBA).
2. Confirm that the main power turns off.
3. If the main power does not turn off, then replace the following parts (D2591, Q2591, R2592, R2593, R2594 and IC1201).
4. Perform steps 1 to 3 again.

## 1. DC 114V (+B) Adjustment

**Purpose:** To obtain correct operation.

**Symptom of Misadjustment:** The picture is dark and the unit does not operate correctly.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| TP2501(+B)<br>TP2504(GND) | VR1601 | --- | --- |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | DC Voltmeter | +114±1.0 V DC | |

**Note:** TP2501(+B), TP2504(GND) --- Sub CBA,
VR1601 --- Main CBA

1. Connect the unit to AC Power Outlet.
2. Connect DC Voltmeter to TP2501(+B) and TP2504(GND).
3. Adjust VR1601 so that the voltage of TP2501(+B) becomes +114±1.0 V DC.

## 2. Setting for CONTRAST, COLOR, TINT, V-TINT and SHARPNESS Data Values

**<TV mode (Composite block)>**

1. Enter Service mode in TV mode.
2. Press [PICTURE] button on the service remote control unit. Display changes “BRT,” “CNT,” “COL,” “TNT,” “V-T,” and “SHP” cyclically when [1] button is pressed.

**CONTRAST (CNT)**

1. Press [1] button to selcet “CONTRAST (CNT)” display.
2. Press [CH. ▲/▼] buttons so that the value of “CONTRAST (CNT)” becomes “88”.

**COLOR (COL)**

1. Press [1] button to select “COLOR (COL)” display.
2. Press [CH. ▲/▼] buttons so that the value of “COLOR (COL)” becomes “48”.

**TINT (TNT)**

1. Press [1] button to select “TINT (TNT)” display.
2. Press [CH. ▲/▼] buttons so that the value of “TINT (TNT)” becomes “56”.

**V-TINT (V-T)**

1. Press [1] button to select “V-TINT (V-T)” display.
2. Press [CH. ▲/▼] buttons so that the value of “V-TINT (V-T)” becomes “50”.

**SHARPNESS (SHP)**

1. Press [1] button to select “SHARPNESS (SHP)” display.
2. Press [CH. ▲/▼] buttons so that the value of “SHARPNESS (SHP)” becomes “43”.

**Note:** **BRIGHT** data value does not need to be adjusted because this setting is performed in other setting.

**<DVD mode (Y-C block)>**

1. Enter Service mode in DVD mode.
2. Press [PICTURE] button on the service remote control unit. Display changes “YC-BRT,” “YC-CNT,” “YC-COL,” “YC-TNT,” and “YC-SHP” cyclically when [2] button is pressed.

**YC-CONTRAST (YC-CNT)**

1. Press [2] button to selcet “YC-CONTRAST (YC-CNT)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YC-CONTRAST (YC-CNT)” becomes “85”.

**YC-COLOR (YC-COL)**

1. Press [2] button to select “YC-COLOR (YC-COL)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YC-COLOR (YC-COL)” becomes “48”.

**YC-TINT (YC-TNT)**

1. Press [2] button to select “YC-TINT (YC-TNT)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YC-TINT (YC-TNT)” becomes “50”.

**YC-SHARPNESS (YC-SHP)**

1. Press [2] button to select “YC-SHARPNESS (YC-SHP)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YC-SHARPNESS (YC-SHP)” becomes “37”.

**<DTV mode (YUV block)>**

1. Enter Service mode in DTV mode.
2. Press [PICTURE] button on the service remote control unit. Display changes “YUV-BRT,” “YUV-CNT,” “YUV-COL,” “YUV-TNT,” and “YUV-SHP” cyclically when [3] button is pressed.

**YUV-CONTRAST (YUV-CNT)**

1. Press [3] button to selcet “YUV-CONTRAST (YUV-CNT)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YUV-CONTRAST (YUV-CNT)” becomes “88”.

**YUV-COLOR (YUV-COL)**

1. Press [3] button to select “YUV-COLOR (YUV-COL)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YUV-COLOR (YUV-COL)” becomes “48”.

**YUV-TINT (YUV-TNT)**

1. Press [3] button to select “YUV-TINT (YUV-TNT)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YUV-TINT (YUV-TNT)” becomes “64”.

**YUV-SHARPNESS (YUV-SHP)**

1. Press [3] button to select “YUV-SHARPNESS (YUV-SHP)” display.
2. Press [CH. ▲/▼] buttons so that the value of “YUV-SHARPNESS (YUV-SHP)” becomes “45”.

## 3. C-Trap Adjustment

**Purpose:** To get minimum leakage of the color signal carrier.

**Symptom of Misadjustment:** If C-Trap Adjustment is incorrect, stripes will appear on the screen.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| TP1301 (BLUE) | [CH ▲ / ▼] buttons | --- | Color Bar |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Oscilloscope Pattern Generator | --- | |

**Figure**

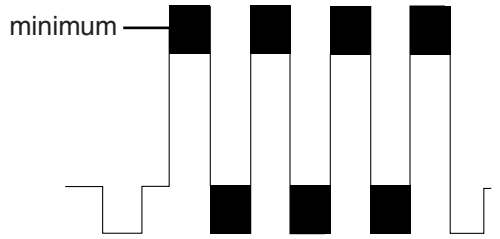



**Fig. 2**

**Note:** TP1301(BLUE) --- Sub CBA

1. Connect oscilloscope to TP1301.
2. Input a color bar signal from RF input. Enter Service mode.
3. Enter the Service mode in TV mode.
4. Press [0] button on the service remote control unit and select C-TRAP mode. (Display changes “C-TRP,” “D-T TV,” “D-T EXT,” “Y SW,” “B-S,” “BS2,” and “C-ANG” cyclically when [0] button is pressed.)
5. Press [CH ▲ / ▼] buttons on the remote control unit so that the carrier leakage B-Out (3.58 MHz) value becomes minimum on the oscilloscope.

## 4. H $f_0$ Adjustment

**Purpose:** To get correct horizontal position and size of screen image.

**Symptom of Misadjustment:** Horizontal position and size of screen image may not be properly displayed.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| R2583 | [CH. ▲ / ▼] buttons | Video | --- |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Frequency Counter | 15.734 kHz±300 Hz | |

**Note:** R2583 --- Sub CBA

1. Connect frequency counter to R2583 and ground.
2. Operate the unit for at least 20 minutes.
3. Enter the Service mode in TV mode.
4. Press [2] button on the service remote control unit and select H-ADJ mode.
5. Press [CH. ▲/▼] buttons on the service remote control unit so that the display will change “0” to “7.”
6. At this moment, choose display “0” to “7” when the frequency counter display is closest to 15.734 kHz ±300 Hz.

## 5. Cut-off/Drive Adjustment

**Purpose:** To adjust the beam current of R, G, B, and screen voltage.

**Symptom of Misadjustment:** White color may be reddish, greenish or bluish.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | Screen-Control [CH. ▲ / ▼] buttons | RF | Black Raster |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator | See Reference Notes below. | |
| **Figure** | | | |

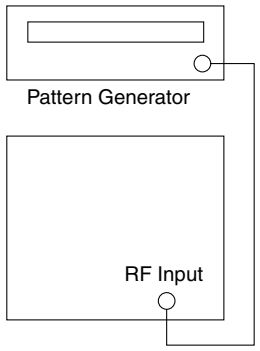



**Fig. 2**

**Note:** Screen Control FBT --- Sub CBA
FBT = Fly Back Transformer
Use the service remote control unit

1. Degauss the CRT and allow the unit to operate for 20 minutes before starting the alignment.
2. Input the Black raster signal from RF input.
3. Enter the Service mode in TV mode.
4. Press [VOL ▽] button on the service remote control to enter "C/D" mode. (Display changes "C/D," "7f," "TUNER," "SLP R," "MONO," "DTV-H/-H2," "BUYER," "DL V-CHIP," "RATING," and "D-SOUND" cyclically when [VOL ▽] button is pressed.)
5. Press [1] button on the service remote control unit and select "COR" mode.The display will momentarily show "COR". Now there should be a horizontal line across the center of the picture tube. If needed, turn the screen control on the flyback in a clockwise direction gradually until the horizontal line appears. Adjust the Red Cut off by pressing the "[CH. ▲ / ▼]" buttons. Proceed to Step 6 when the Red Cut off adjustment is done.
6. Press [2] button on the service remote control unit and select "COG" mode. The display will momentarily show "COG". Adjust the Green Cut off by pressing the "[CH. ▲ / ▼]" buttons. Proceed to step 7 when the Green Cut off adjustment is done.
7. Press [3] button on the service remote control unit and select "COB" mode. The display will momentarily show "COB". Adjust the Blue cut off by pressing the "[CH. ▲ / ▼]" buttons. When done with steps 5, 6 and 7 the horizontal line should be pure white, If not, then attempt the Cut off adjustment again.

## 6. White Balance Adjustment

**Purpose:** To mix red, green and blue beams correctly for pure white.

**Symptom of Misadjustment:** White becomes bluish or reddish.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| Screen | [CH. ▲/▼] buttons | RF | White Raster (APL 100%) |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator, Color analyzer | See below | |
| **Figure** | | | |

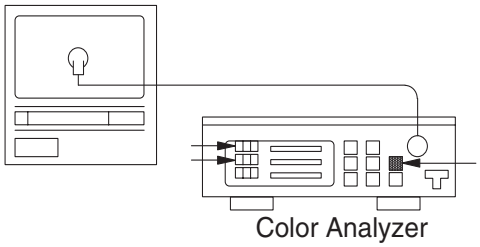



**Fig. 3**

**Note:** Use the service remote control unit

1. Operate the unit more than 20 minutes.
2. Face the unit to the east. Degauss the CRT using a degaussing coil.
3. Input the White Raster (APL 100%).
4. Set the color analyzer to the CHROMA mode and after zero point calibration, bring the optical receptor to the center on the tube surface (CRT).
5. Enter the Service mode in TV Mode.
6. Press [VOL ▽] button on the service remote control to enter "C/D" mode. (Display changes "C/D," "7f," "TUNER," "SLP R," "MONO," "DTV-H/-H2," "BUYER," "DL V-CHIP," "RATING," and "D-SOUND" cyclically when [VOL ▽] button is pressed.)
7. Press [4] button on the service remote control unit for Red adjustment. Press [5] button on the service remote control unit for Blue adjustment.
8. In each color mode, press [CH. ▲/▼] buttons to adjust the values of color.

9. Adjust Red and Blue color so that the temperature becomes 9200K (x: 286 / y: 294) ±3%.
10. At this time, check if horizontal line is white. If not, adjust Cut-off Adjustment until the horizontal line becomes pure white.
11. Turn off and on again to return to the normal mode. Receive APL 100% white signal and confirm that Chroma temperatures become 9200K (x: 286 / y: 294) ±3%.

**Note:** Confirm that Cut Off Adj. is correct after this adjustment, and attempt Cut Off Adj, if needed.

## 7. Sub-Brightness Adjustment

**Purpose:** To get proper brightness.

**Symptom of Misadjustment:** If Sub-Brightness is incorrect, proper brightness cannot be obtained by adjusting the Brightness Control.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | [CH. ▲/▼] buttons | RF | Black Raster 7.5IRE |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator, Color analyzer | See below | |

**Figure**

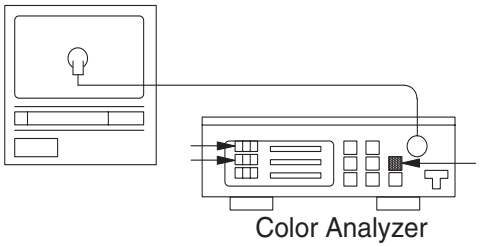



**Fig. 4**

**Note:** SMPTE Setup level --- 7.5 IRE

1. Enter the Service mode.
   Then input SMPTE signal from RF input.
2. Press [PICTURE] button on the service remote control unit.
3. Press [1] button on the service remote control unit and selcet “BRT” mode. (Display changes “BRT,” “CNT,” “COL,” “TNT,” “V-T,” and “SHP” cyclically when [1] button is pressed.)
4. Press [CH ▲/▼] buttons so that the Luminance level is 0.05 ~ 0.2 ft-L.

## 8. Focus Adjustment

**Purpose:** Set the optimum Focus.

**Symptom of Misadjustment:** If Focus Adjustment is incorrect, blurred images are shown on the display.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | Focus Control | --- | Monoscope |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator | See below | |

**Note:** Focus Control FBT --- Sub CBA
FBT = Fly Back Transformer

1. Operate the unit more than 30 minutes.
2. Face the unit to the East and degauss the CRT using a degaussing coil.
3. Input the monoscope pattern.
4. Adjust the focus control on the FBT to obtain a clear picture.

## 9. H. Position Adjustment

**Purpose:** To obtain correct horizontal position of screen image.

**Symptom of Misadjustment:** H. position may not be properly displayed.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | [CH. ▲/▼] buttons | --- | Monoscope |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator | --- | |

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV mode.
3. Press [8] button on the service remote control unit and select "H-P" mode.
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the left and right side of the monoscope pattern are equal to each other.

## 10. V. Position Adjustment

**Purpose:** To obtain correct vertical position of screen image.

**Symptom of Misadjustment:** If V. position is incorrect, vertical position of image on the screen may not be properly displayed.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | [CH. ▲/▼] buttons | --- | Monoscope |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator | --- | |

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV mode.
3. Press [9] button on the service remote control unit and select "V-P" mode. (Display changes "V-S" and "V-P" cyclically when [9] button is pressed.)
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the top and bottom of the monoscope pattern are equal each other.

## 11. V. Size Adjustment

**Purpose:** To obtain correct vertical height of screen image.

**Symptom of Misadjustment:** If V. Size is incorrect, vertical height of image on the screen may not be properly displayed.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | [CH. ▲/▼] buttons | --- | Monoscope |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator | 90%±5% | |

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV mode.
3. Press [9] button on the service remote control unit and select V-S mode. (Display changes "V-S" and "V-P" cyclically when [9] button is pressed.)
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the remote control unit so that the monoscope pattern is 90±5% of display size and the circle is round.

## 12. Head Switching Position Adjustment

**Purpose:** Determine the Head Switching Position during Playback.

**Symptom of Misadjustment:** May cause Head Switching Noise or Vertical Jitter in the picture.

**Note:** Unit reads Head Switching Position automatically and displays it on the screen (Upper Left Corner).

1. Playback test tape (VFMS0001H6).
2. Enter the Service mode in TV mode.
3. Press [5] button on the service remote control unit.
4. The Head Switching position will display on the screen; if adjustment is necessary follow step 4. 6.5H(412.7μs) is preferable.
5. Press [CH. ▲ / ▼] buttons on the service remote control unit if necessary. The value will be changed in 0.5H steps up or down. Adjustable range is up to 9.5H. If the value is beyond adjustable range, the display will change as:
   Lower out of range: 0.0H
   Upper out of range: -.-H

**The following 2 adjustments normally are not attempted in the field. They should be done only when replacing the CRT then adjust as a preparation.**

## 13. Purity Adjustment

**Purpose:** To obtain pure color.

**Symptom of Misadjustment:** If Color Purity Adjustment is incorrect, large areas of color may not be properly displayed.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | Deflection Yoke Purity Magnet | --- | *Red Color |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator | See below | |
| **Figure** | | | |

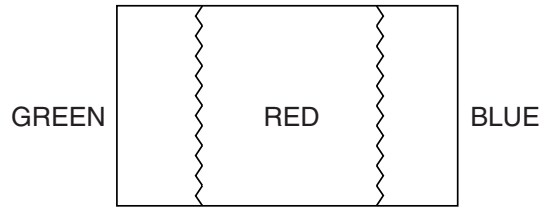



**Fig. 5**

* This becomes RED COLOR if the [7] button is pressed while in service mode.

1. Set the unit facing east.
2. Operate the unit for over 30 minutes before adjusting.
3. Fully degauss the unit using an external degaussing coil.
4. Set the unit to the AUX mode which is located before CH2 then input a red raster from video in.
5. Loosen the screw on the Deflection Yoke Clamper and pull the Deflection Yoke back away from the screen. (See Fig. 6.)
6. Loosen the Ring Lock and adjust the Purity Magnets so that a red field is obtained at the center of the screen. Tighten Ring Lock. (See Fig. 5, 6.)
7. Slowly push the Deflection Yoke toward the bell of the CRT and set it where a uniform red field is obtained.
8. Tighten the clamp screw on the Deflection Yoke.

## 14. Convergence Adjustment

**Purpose:** To obtain proper convergence of red, green and blue beams.

**Symptom of Misadjustment:** If Convergence Adjustment is incorrect, the edge of white letters may have color edges.

| Test Point | Adj. Point | Mode | Input |
|---|---|---|---|
| --- | C.P. Magnet (RB)<br>C.P. Magnet (RB-G)<br>Deflection Yoke | --- | Dot Pattern<br>or<br>Crosshatch |
| **Tape** | **M. EQ.** | **Spec.** | |
| --- | Pattern Generator | See below | |
| **Figure** | | | |

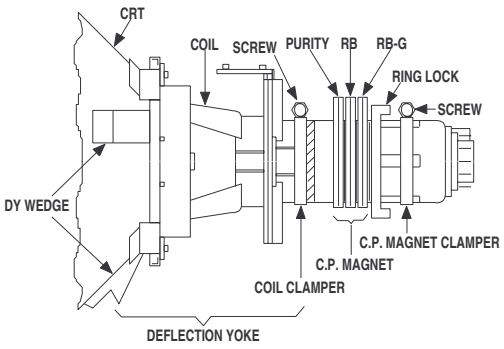



**Fig. 6**

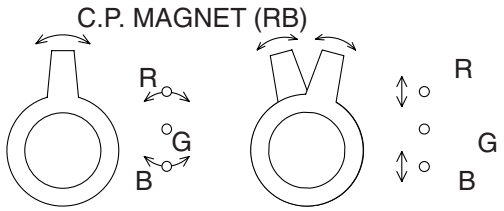



**Fig. 7**

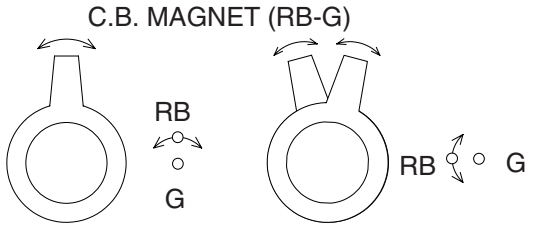



**Fig. 8**

1. Set the unit to the AUX mode which is located before CH2 then input a dot or crosshatch pattern.
2. Loosen the Ring Lock and align red with blue dots or crosshatch at the center of the screen by rotating (RB) C.P. Magnets. (See Fig. 7.)
3. Align red / blue with green dots at the center of the screen by rotating (RB-G) C.P. Magnet. (See Fig. 8.)

4. Fix the C.P. Magnets by tightening the Ring Lock.
5. Remove the DY Wedges and slightly tilt the Deflection Yoke horizontally and vertically to obtain the best overall convergence.
6. Fix the Deflection Yoke by carefully inserting the DY Wedges between CRT and Deflection Yoke.

# HOW TO INITIALIZE THE TV/DVD/VCR

To put the program back at the factory-default, initialize the TV/DVD/VCR as the following procedure.

## < DVD Section >

1. Turn the power on and press [SELECT] button on the TV unit to put the TV/DVD/VCR into DVD mode.
2. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order.
   Fig. a appears on the screen.

"*******" differ depending on the models.

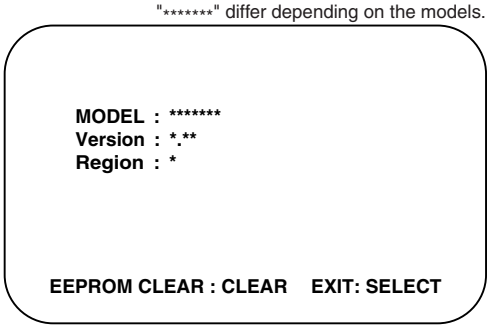



Fig. a

3. Press [CLEAR] button on the remote control unit.
   Fig. b appears on the screen.

"*******" differ depending on the models.

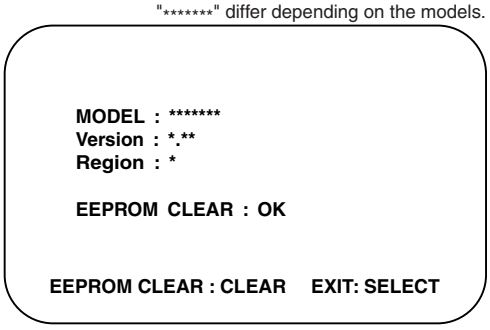



Fig. b

   When “OK” appears on the screen, the factory default will be set.
4. To exit this mode, press [CH. ▲/▼] or [SELECT] button on the TV unit to go to TV mode, or press [POWER] button to turn the power off.

## < TV/VCR Section >

1. Use the service remote control unit.
2. Turn the power on and press [SELECT] button on the TV unit to select TV mode. (Use main power on the TV unit.)
3. Press the service button on the service remote control unit to enter Service mode. (Refer to “How to enter Service mode” on page 1-7-1.)
4. Press [VOL ▽] button on the service remote control unit twice, and confirm that OSD indication is “7F = FF.” If needed, set it to become “7F = FF” by pressing [CH. ▲/▼] buttons on the service remote control unit.
5. Confirm that OSD indication on the four corners on TV screen changes from on and off light indication to red by pressing [DISPLAY] button. (It is necessary for one or two seconds.)
6. Press [POWER] button to release from Service mode.

## < DTV Section >

1. Use the service remote control unit.
2. Turn the power on and press [SELECT] button on the TV unit to select DTV mode. (Use main power on the TV unit.)
3. Press the service button on the service remote control unit to enter Service mode. (Refer to “How to enter Service mode” on page 1-7-1.)
4. Confirm that OSD indication on the four corners on TV screen changes to red by pressing [DISPLAY] button.
5. Press [POWER] button to release from Service mode.
6. Press [SELECT] button on the TV unit to change to AUX mode.

## < Both TV/VCR and DTV Section >

1. Turn the power on and press [SELECT] button on the TV unit to select DTV mode.
2. Press the service button to enter Service mode.
3. Press [DISPLAY] button to initialize in DTV mode.
4. Press [POWER] button to release from Service mode.
5. Press [SELECT] button to change to AUX mode.
6. Press the service button to enter Service mode.
7. Press [DISPLAY] button to initialize in TV mode.
8. Press [POWER] button (or [RETURN] and [5] buttons) to release from Service mode. Initializing is complete.

# FIRMWARE RENEWAL MODE

1. Turn the power on and press [SELECT] button on the TV unit to put the TV/DVD/VCR into DVD mode. Then remove the disc on the tray.
   (It is possible to move to F/W version up mode only when the TV/DVD/VCR is in DVD mode with the tray open.)
2. To put the TV/DVD/VCR into F/W version up mode, press [9], [8], [7], [6], and [MODE] buttons on the remote control unit in that order.
   Fig. a appears on the screen.

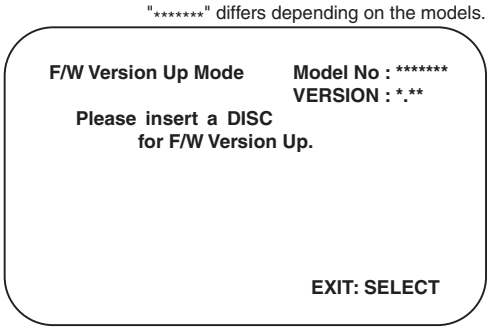



Fig. a Version Up Mode Screen

   The TV/DVD/VCR can also enter the version up mode with the tray open. In this case, Fig. a will be shown on the screen while the tray is open.

3. Load the disc for version up.
4. The TV/DVD/VCR enters the F/W version up mode automatically. Fig. b appears on the screen. If you enter the F/W for different models, “Disc Error” will appear on the screen, then the tray will open automatically.

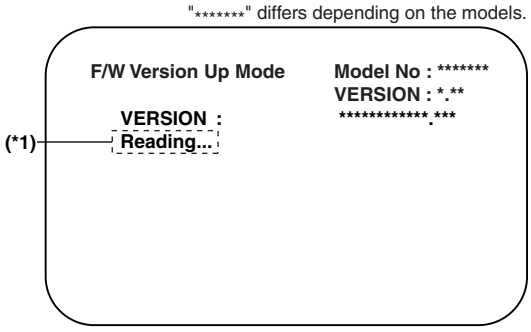



Fig. b Programming Mode Screen

   The appearance shown in (*1) of Fig. b is described as follows:

| No. | Appearance | State |
|---|---|---|
| 1 | Reading... | Sending files into the memory |
| 2 | Erasing... | Erasing previous version data |
| 3 | Programming... | Writing new version data |

5. After programming is finished, the tray opens automatically. Fig. c appears on the screen and the checksum will be shown in (*2) of Fig. c.

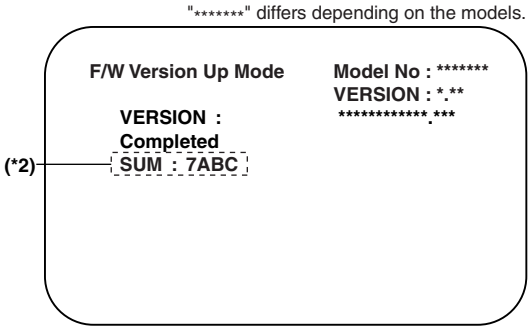



Fig. c Completed Program Mode Screen

   At this time, no button is available.

6. Remove the disc on the tray.
7. Press [SELECT] button on theTV unit to go to TV mode, or press [POWER] button on the unit to turn the power off.
8. Press [SELECT] button on the TV unit to put the TV/DVD/VCR into DVD mode again.
9. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order.
   Fig. d appears on the screen.

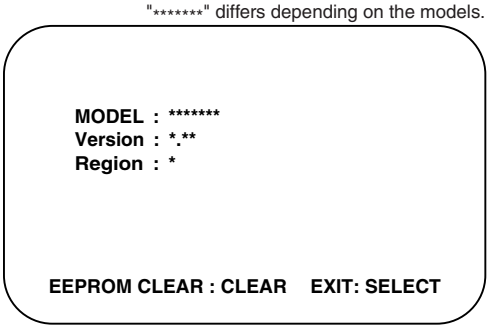



Fig. d

10. Press [CLEAR] button on the remote control unit.
    Fig. e appears on the screen.

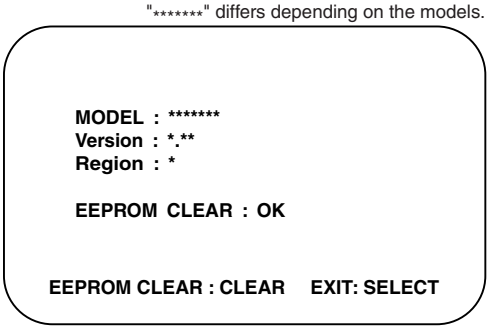


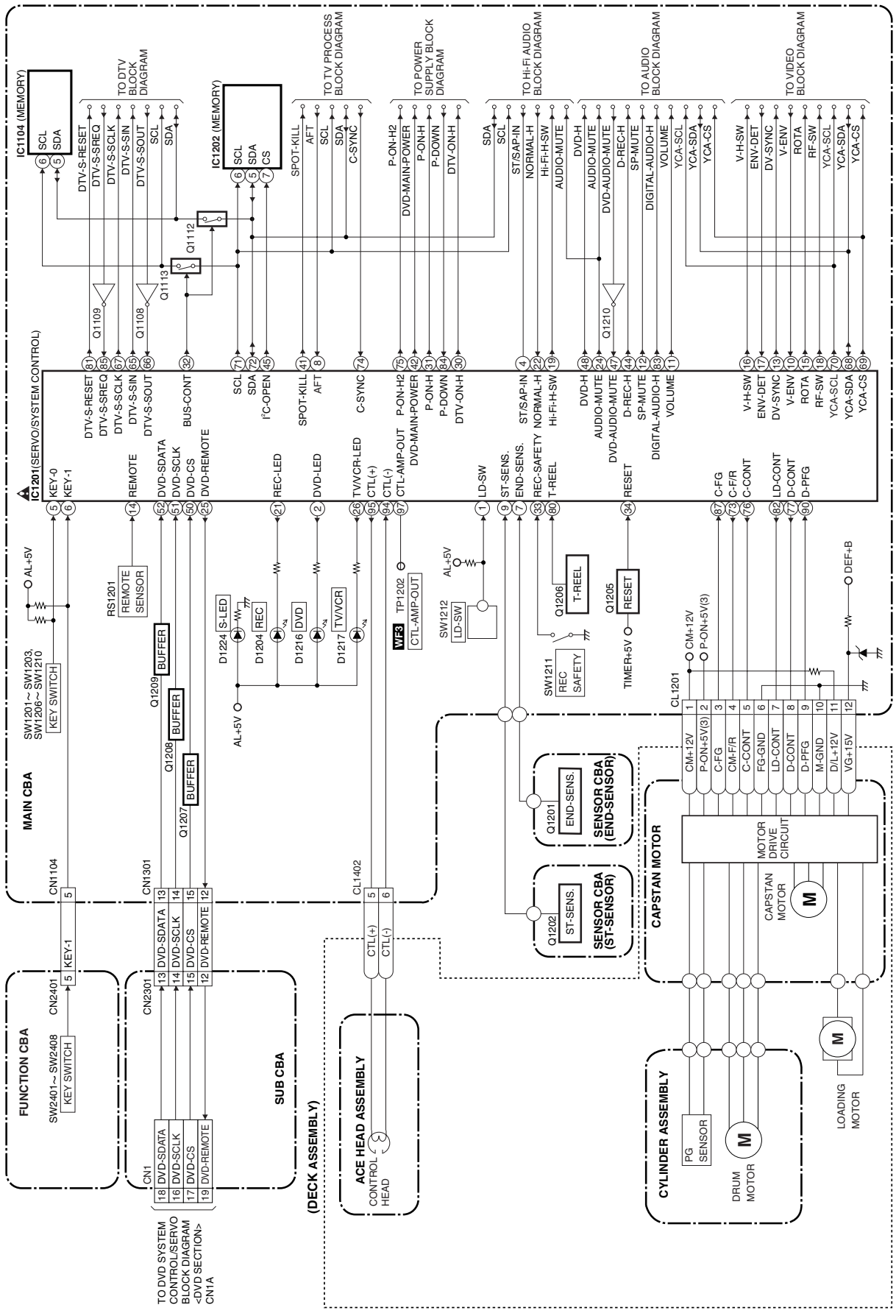

Fig. e

    When “OK” appears on the screen, the factory default will be set. Then the firmware renewal mode is complete.

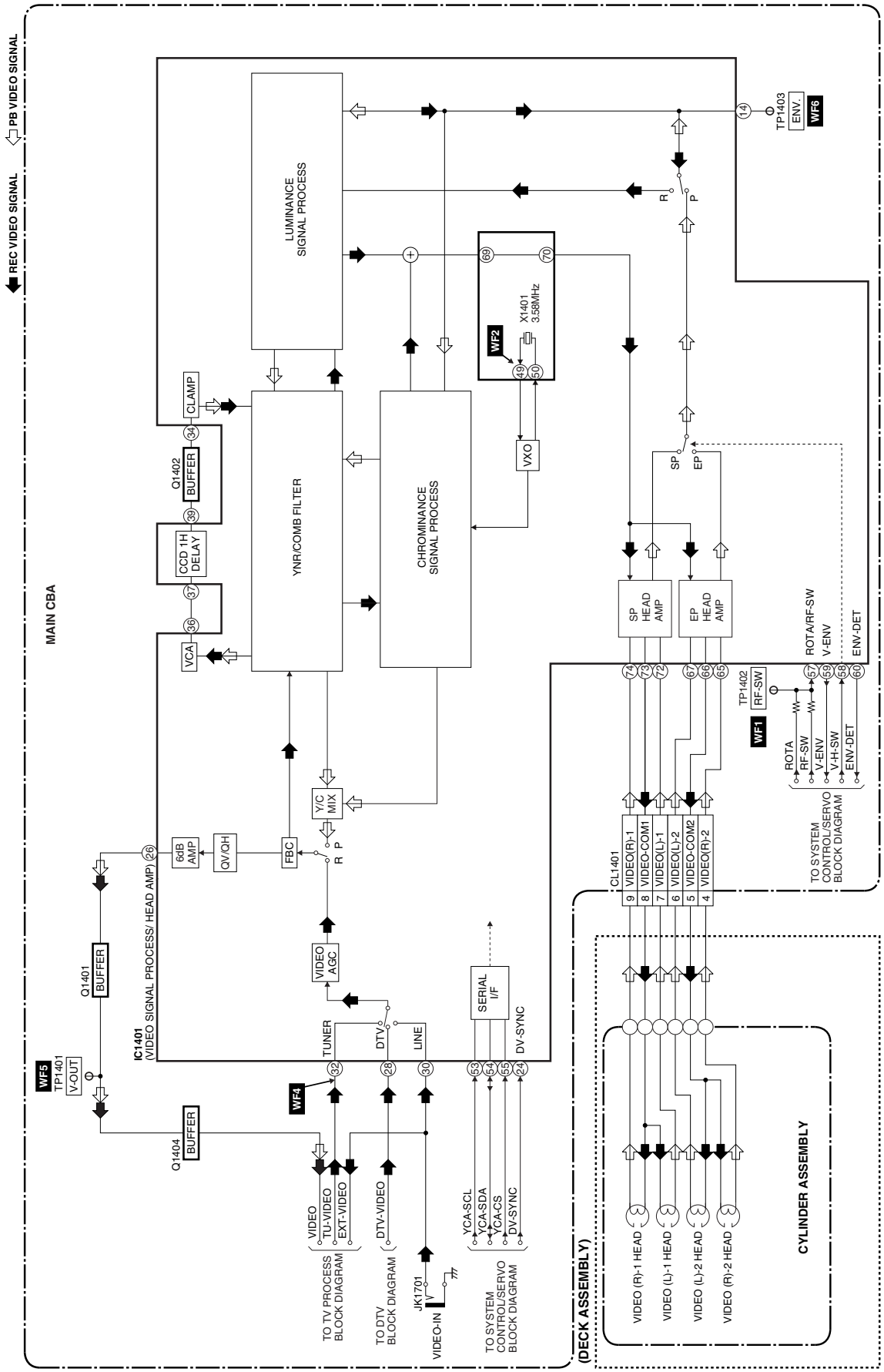
11. To exit this mode, press [CH. ▲ / ▼] or [SELECT] button on the TV unit to go to TV mode, or press [POWER] button to turn the power off.

# BLOCK DIAGRAMS < TV/VCR Section >

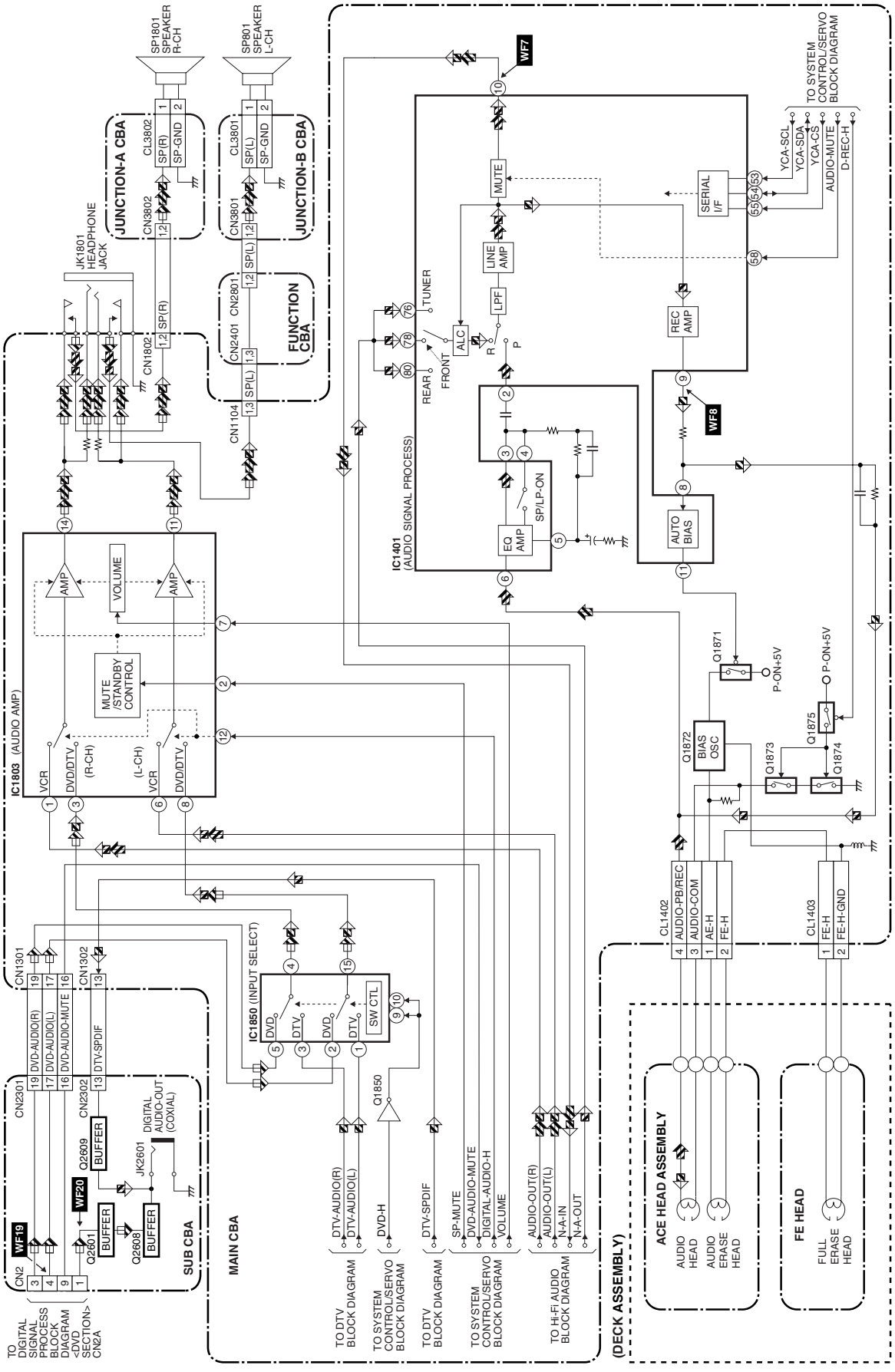
## System Control / Servo Block Diagram



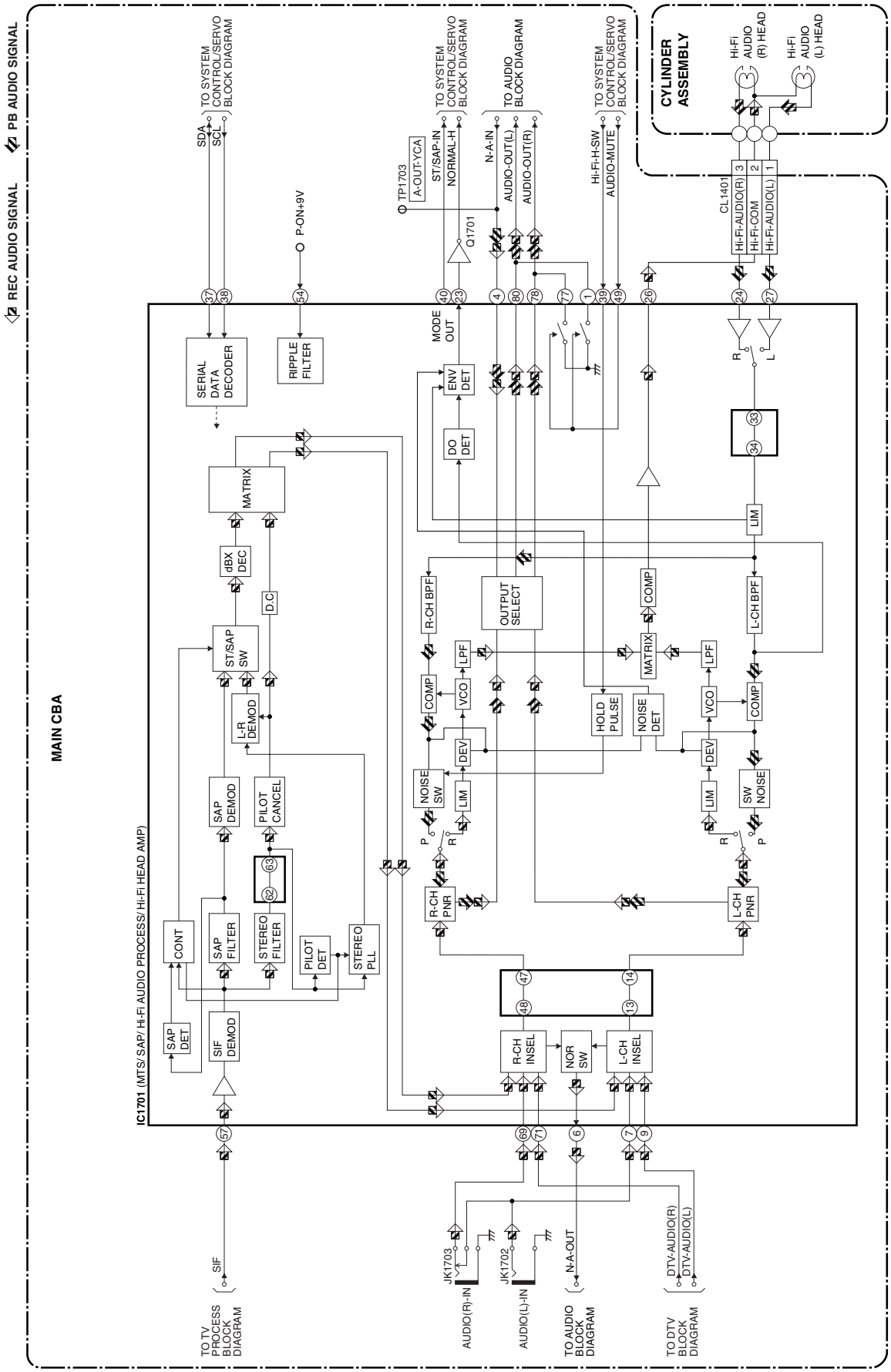
# Video Block Diagram



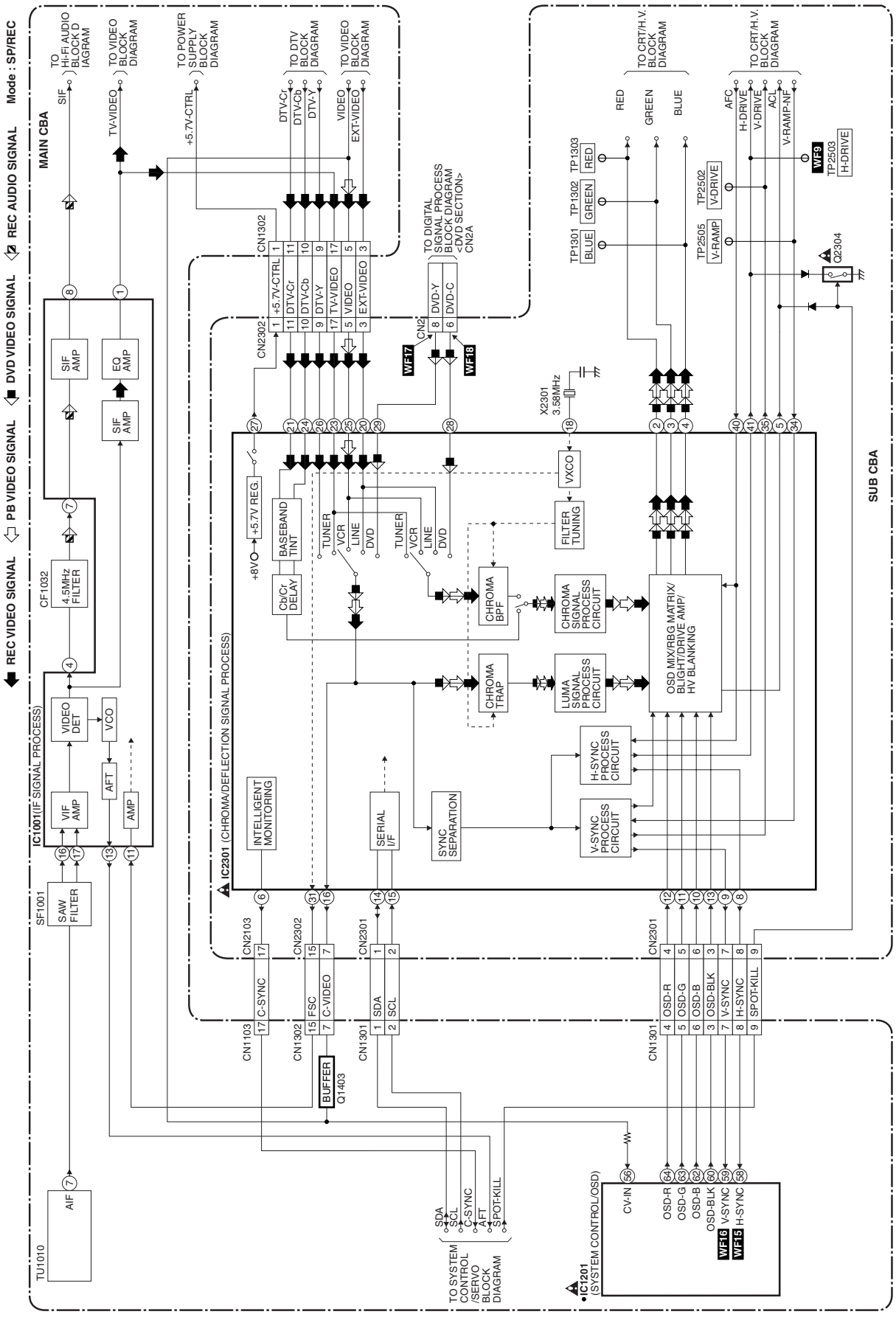
# Audio Block Diagram



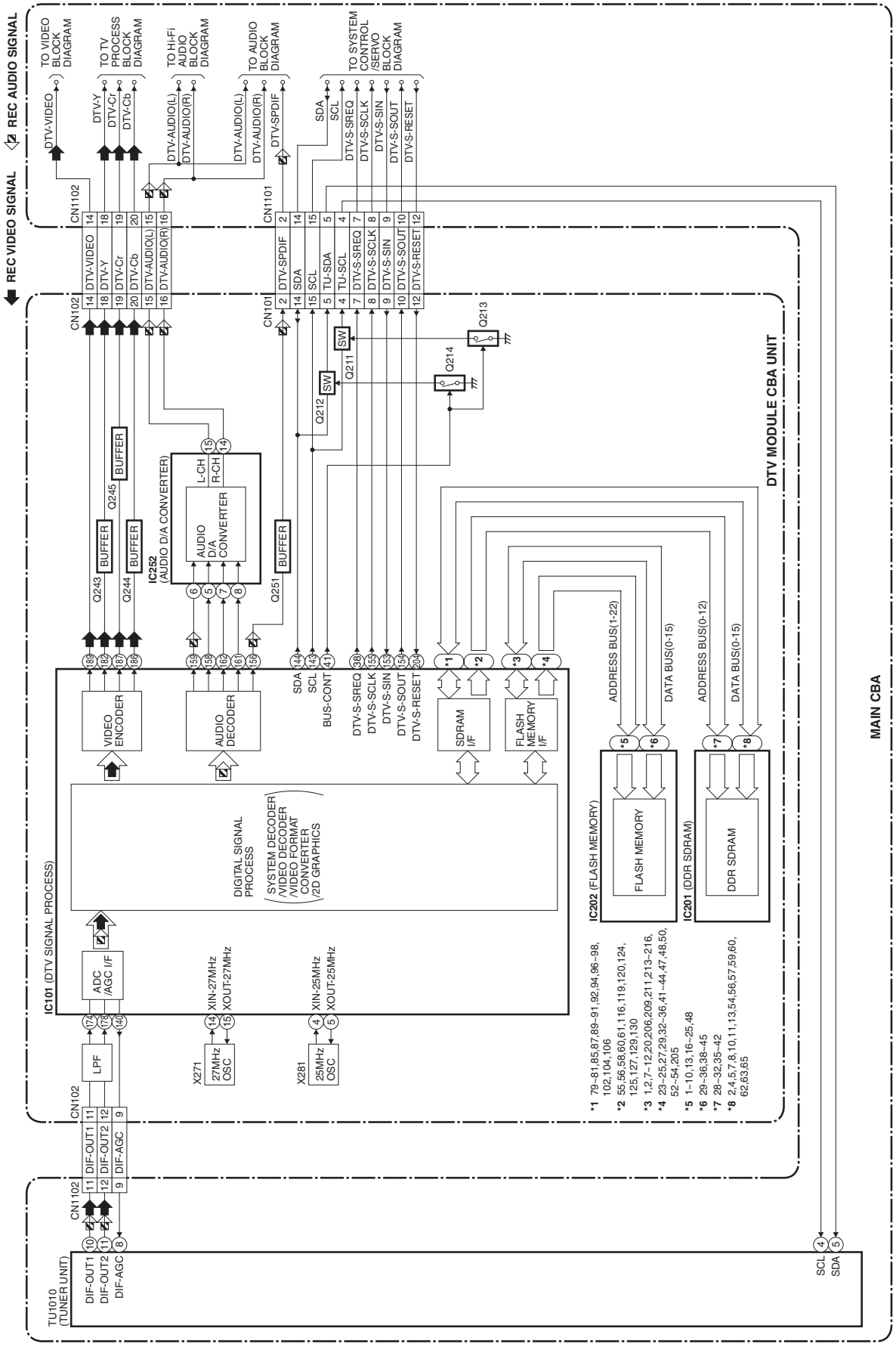
# Hi-Fi Audio Block Diagram



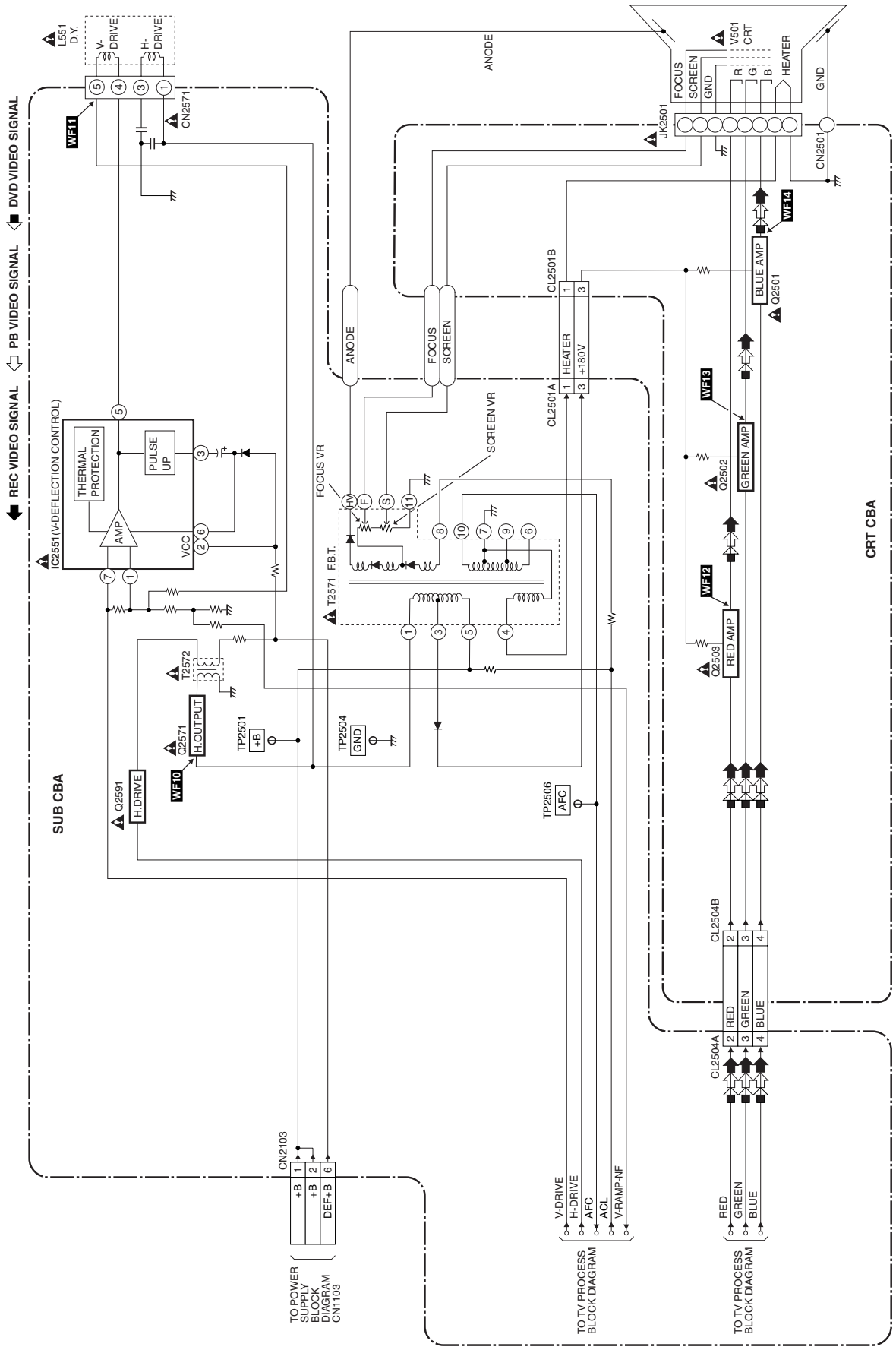
# TV Process Block Diagram



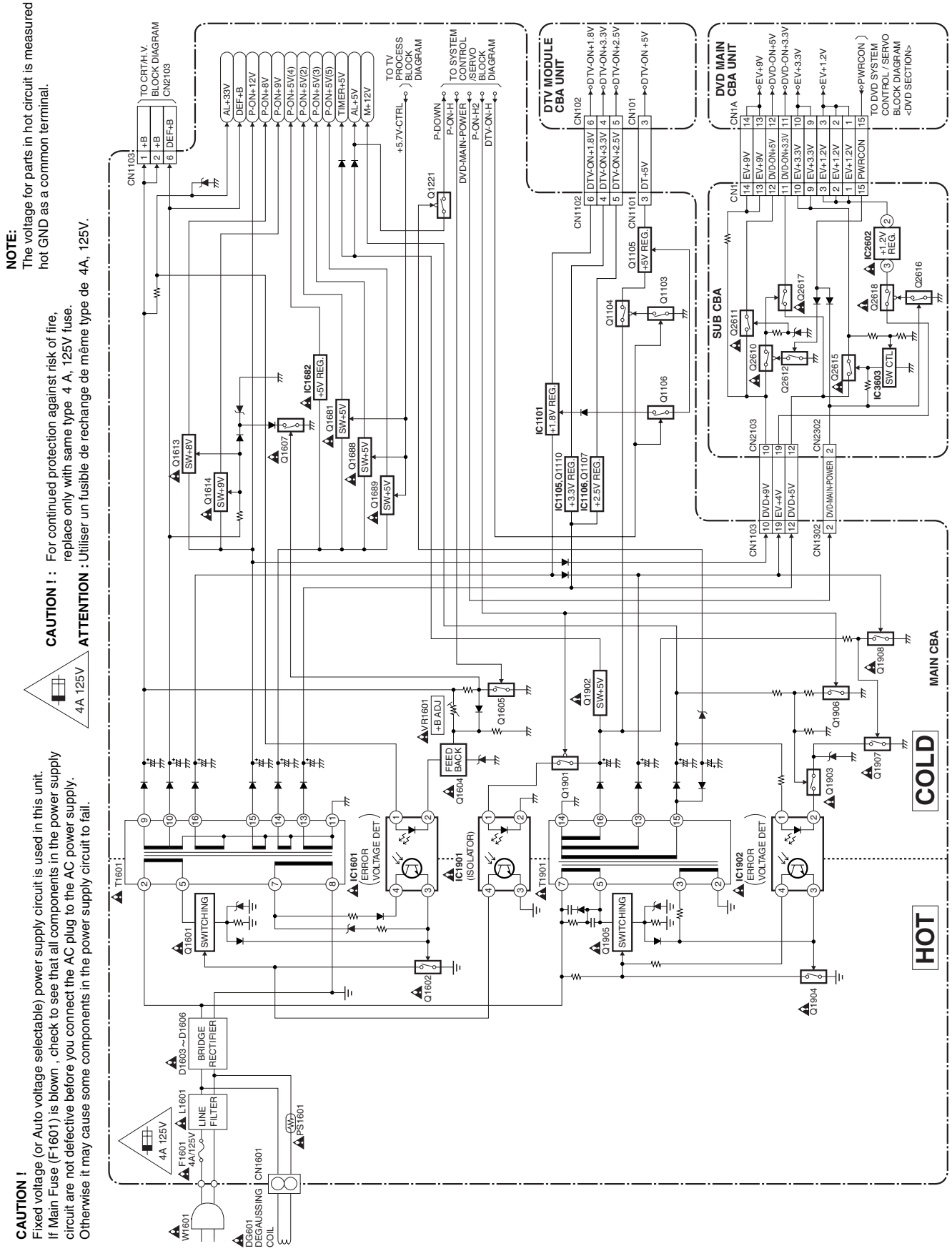
# DTV Block Diagram



# CRT/H.V. Block Diagram

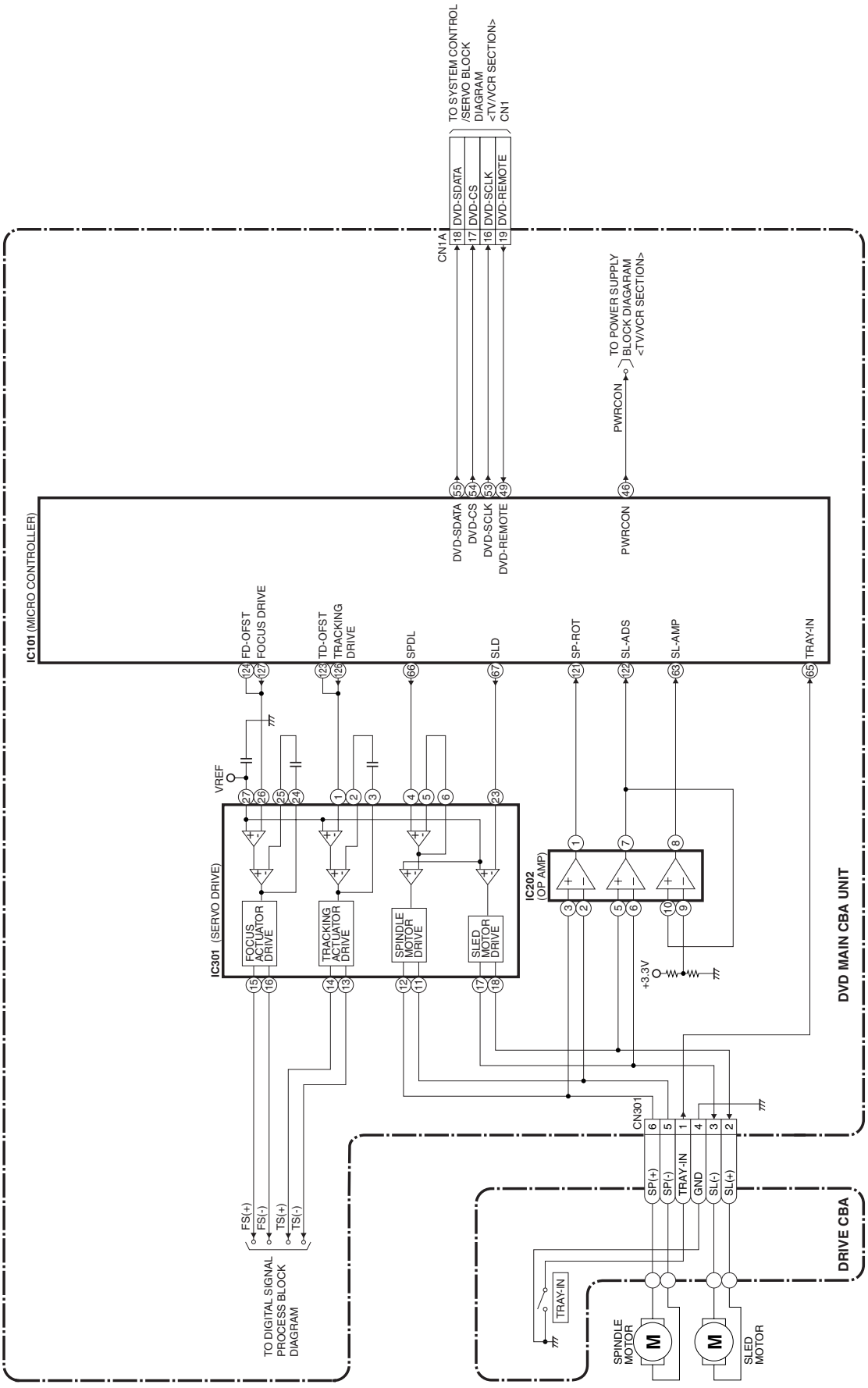


# Power Supply Block Diagram

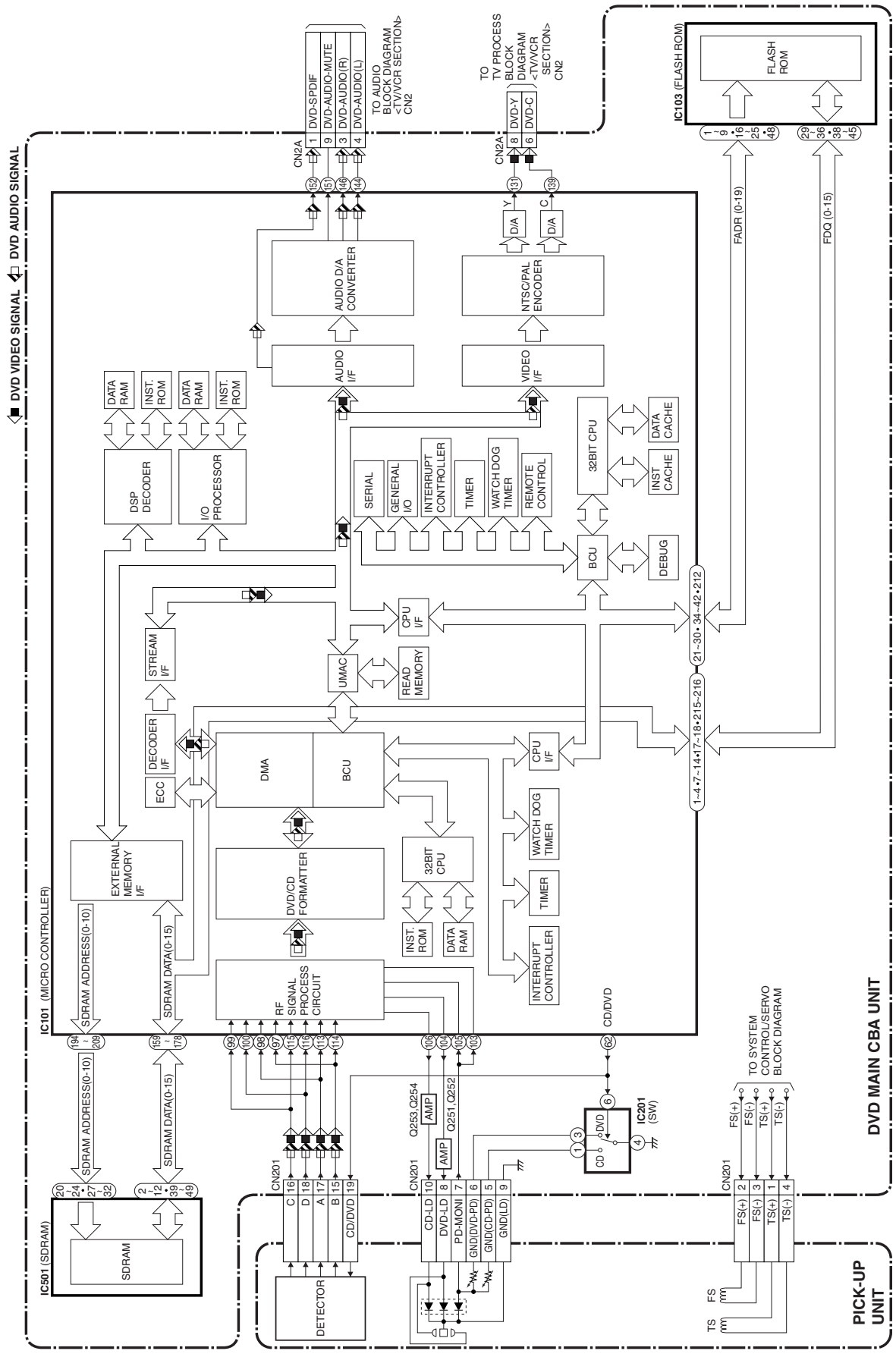


# BLOCK DIAGRAMS < DVD Section >

## DVD System Control / Servo Block Diagram



# Digital Signal Process Block Diagram



# SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

## Standard Notes

### WARNING

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark "⚠" in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

### Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K = 10^3$, $M = 10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P = 10^{-6}$ μF).
5. All voltages are DC voltages unless otherwise specified.

## LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

**1. CAUTION:** FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE_A,_V FUSE.
**ATTENTION:** UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE_A,_V.

**2. CAUTION:**

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1601) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

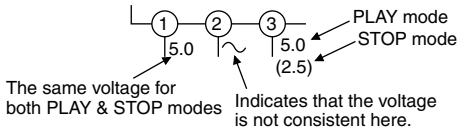
### 3. Note:

1. Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
2. To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

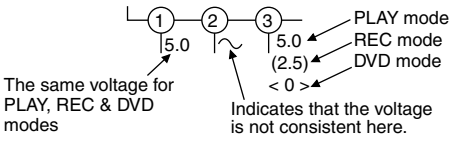
### 4. Mode: SP/REC

### 5. Voltage indications on the schematics are as shown below:

< DVD Section >

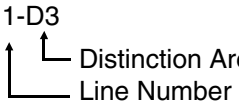



< TV/VCR Section >

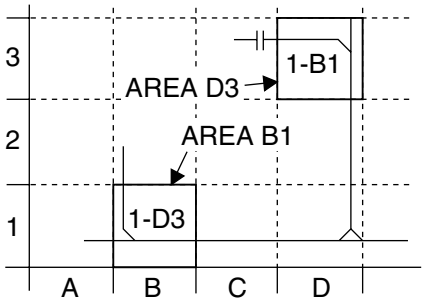



Unit: Volts

### 6. How to read converged lines




Examples:
1. "1-D3" means that line number "1" goes to the line number "1" of the area "D3".
2. "1-B1" means that line number "1" goes to the line number "1" of the area "B1".




### 7. Test Point Information

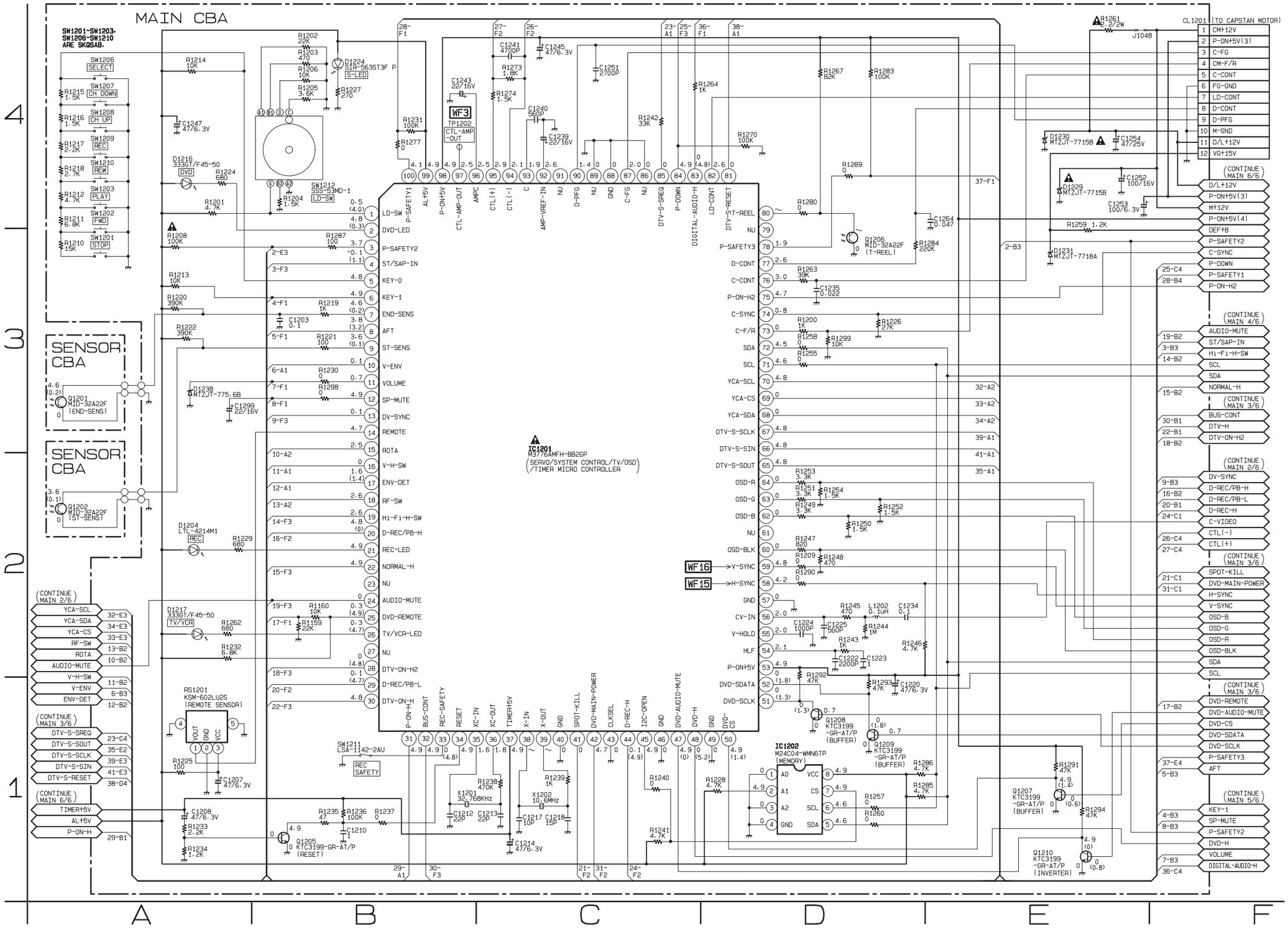
: Indicates a test point with a jumper wire across a hole in the PCB.

: Used to indicate a test point with a component lead on foil side.

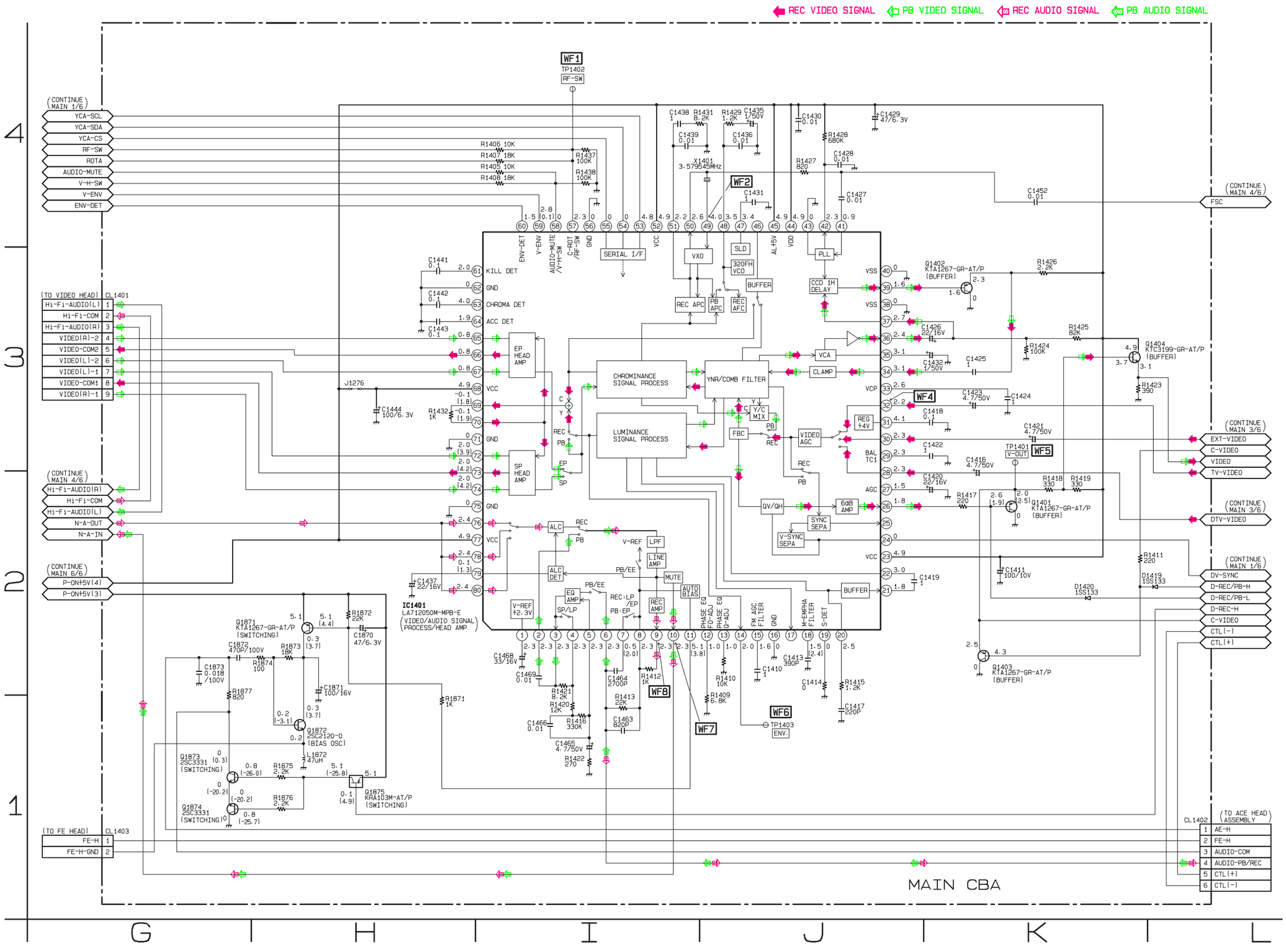
: Used to indicate a test point with no test pin.

: Used to indicate a test point with a test pin.

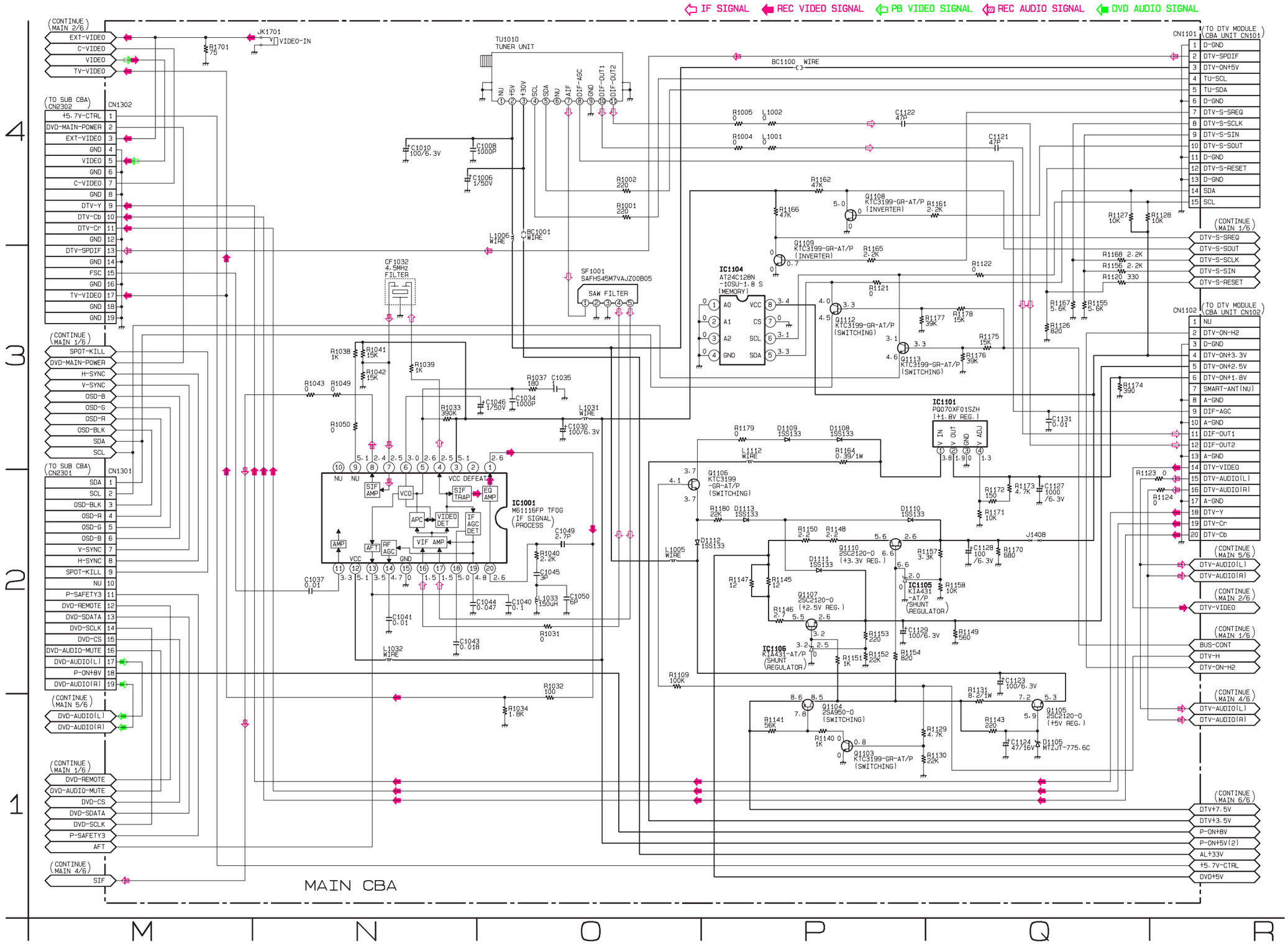
# Main 1/6 & Sensor Schematic Diagram < TV/VCR Section >



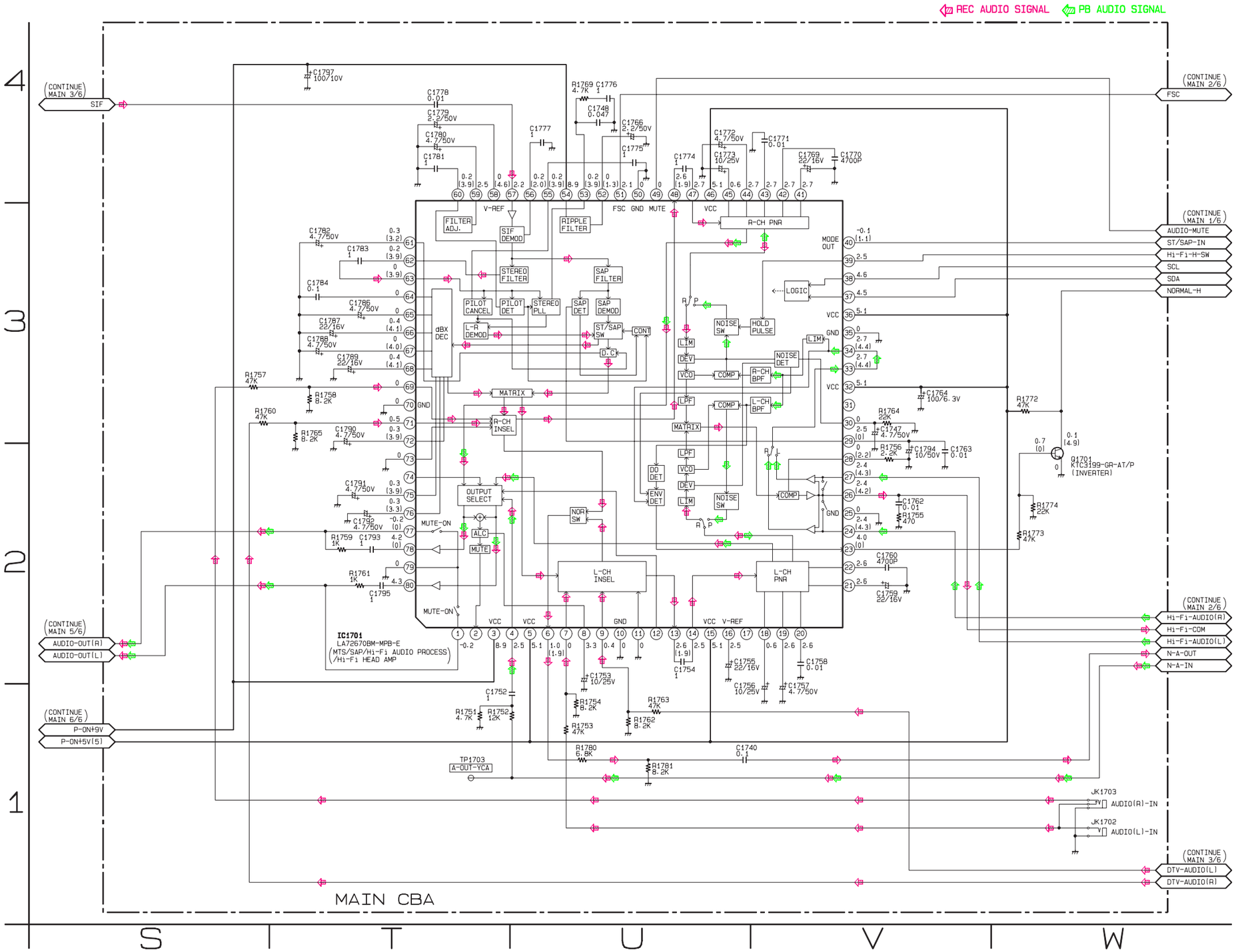
# Main 2/6 Schematic Diagram < TV/VCR Section >



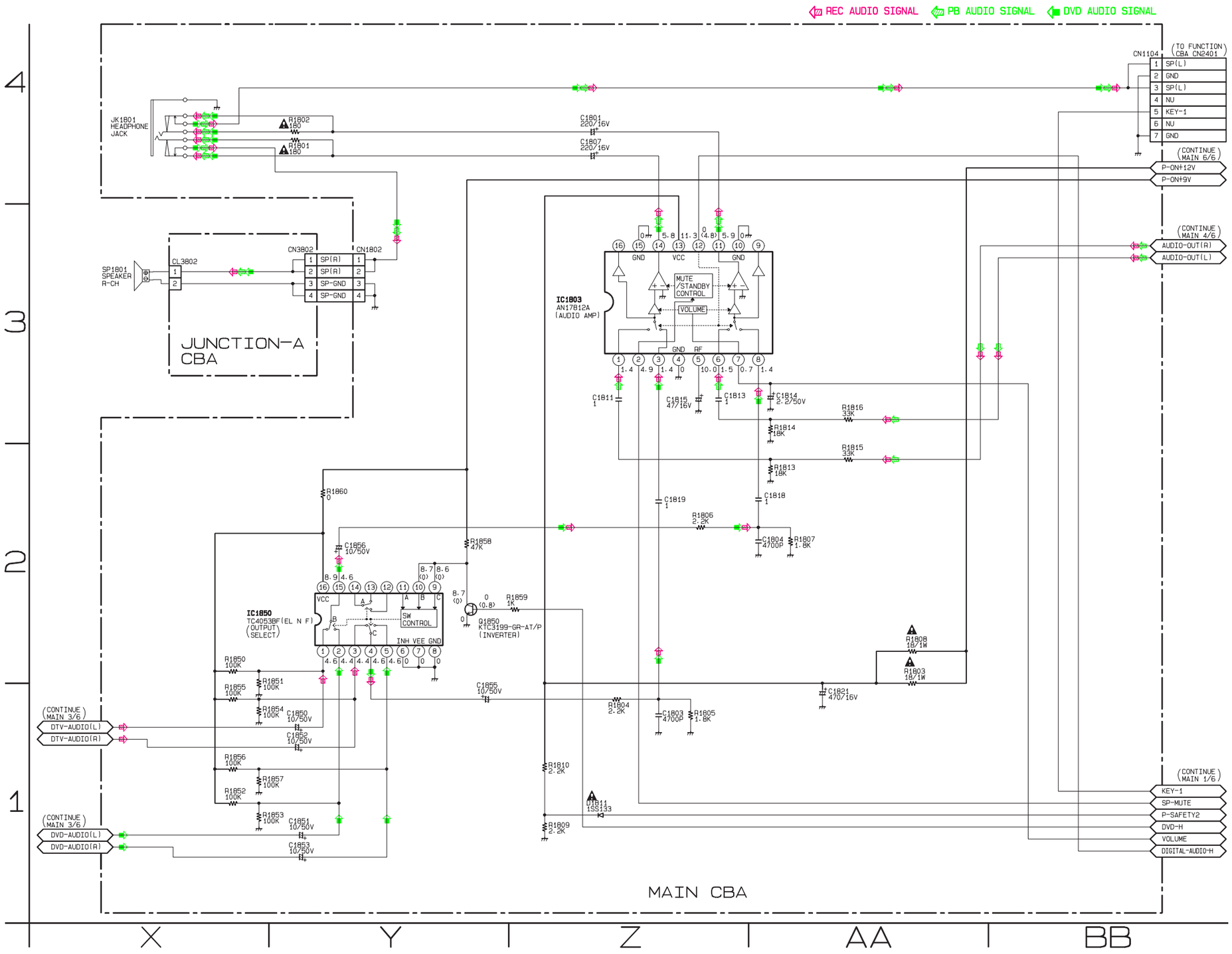
# Main 3/6 Schematic Diagram < TV/VCR Section >



# Main 4/6 Schematic Diagram < TV/VCR Section >



# Main 5/6 & Junction-A Schematic Diagram < TV/VCR Section >



# Main 6/6 Schematic Diagram < TV/VCR Section >

4A 125V

**CAUTION ! :** For continued protection against risk of fire, replace only with same type 4 A, 125V fuse.
**ATTENTION :** Utiliser un fusible de rechange de même type de 4A, 125V.

**CAUTION !**
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

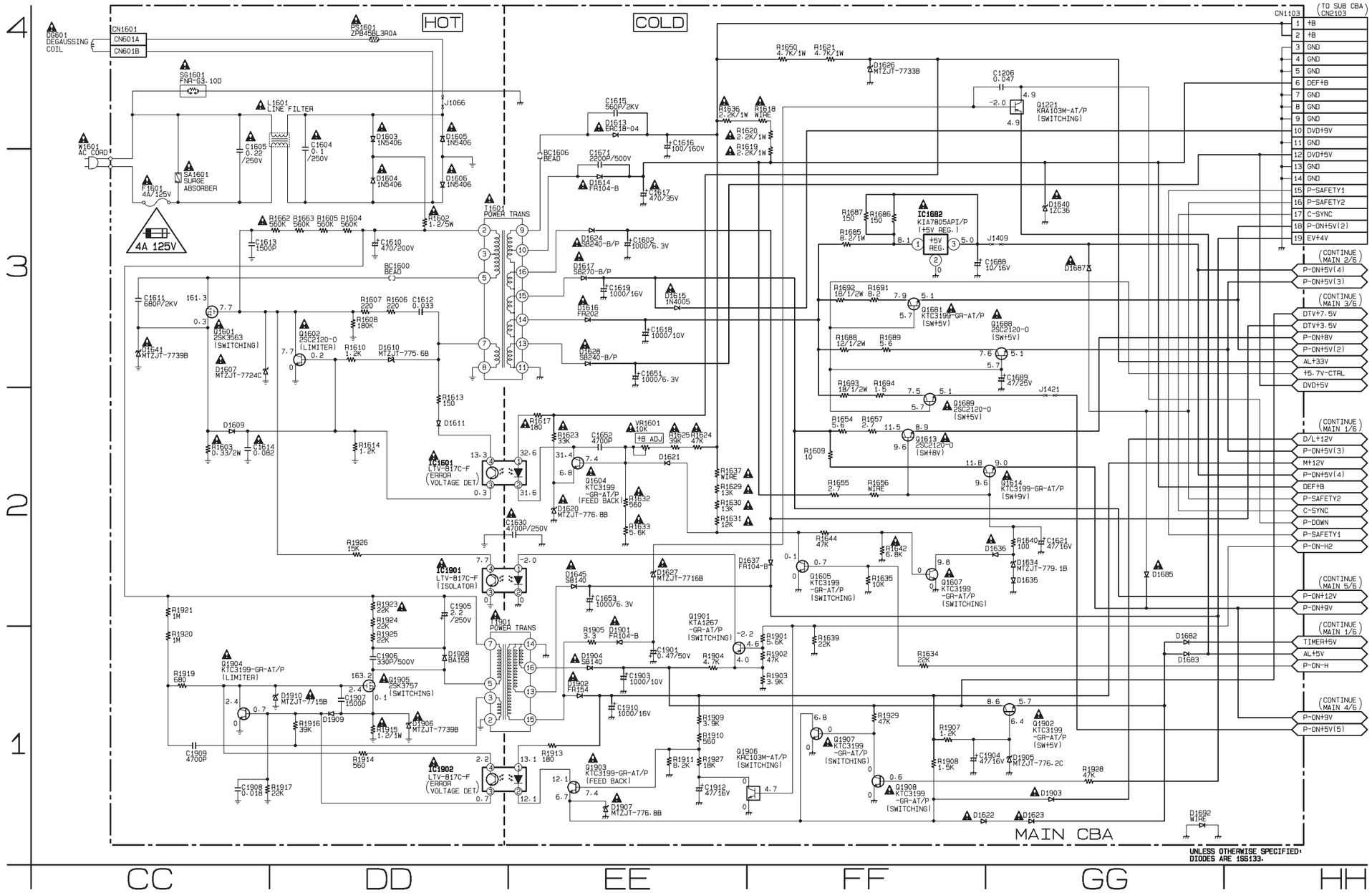
**NOTE:**
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**VOLTAGE CHART (Power off mode)**

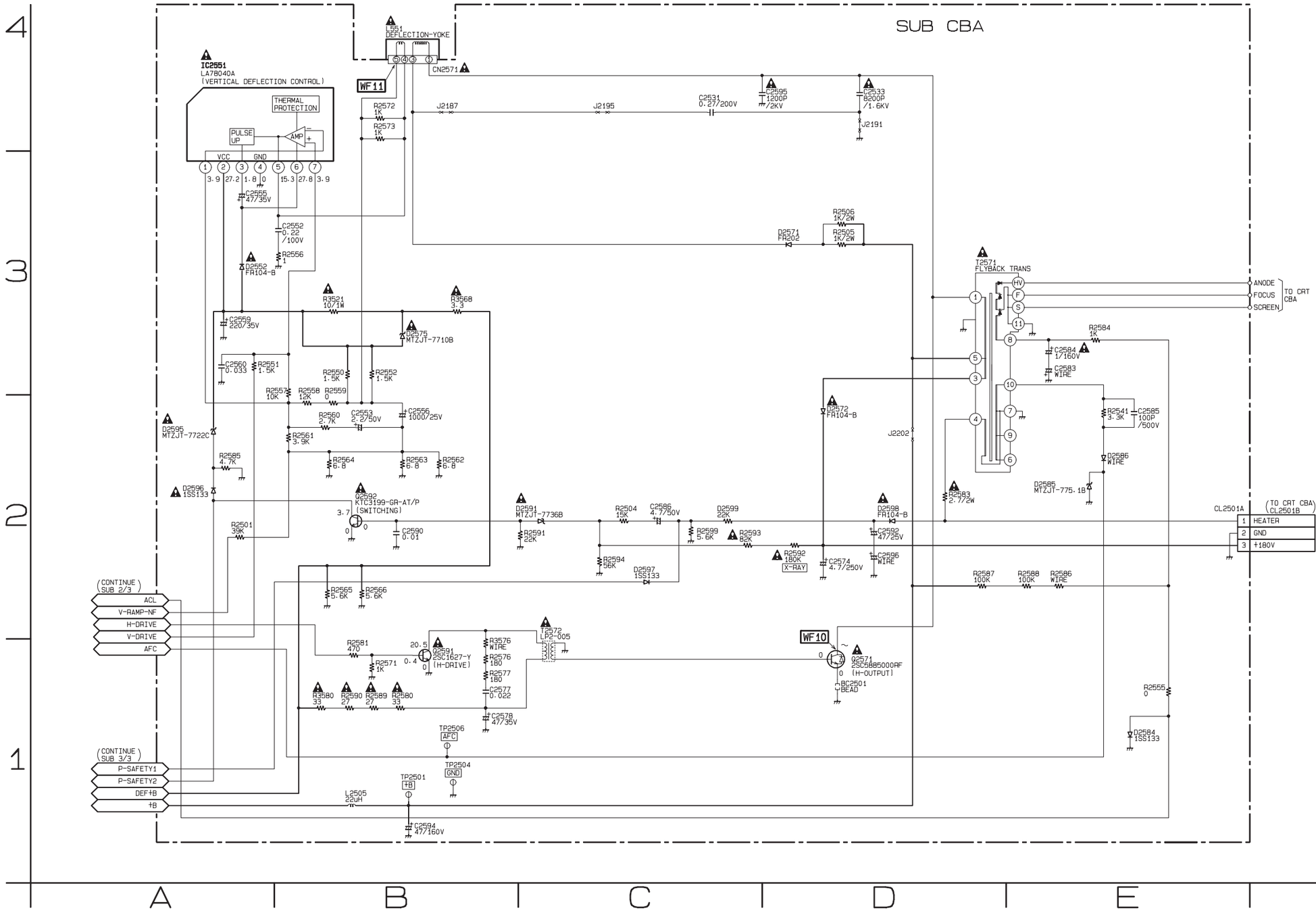
| Ref. No. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| IC1601 | 0 | 0.1 | 0 | 2.2 |
| IC1901 | 1.1 | 0 | 0 | 0.1 |
| IC1902 | 11.3 | 10.3 | 0.7 | 1.1 |

| Ref. No. | 1 | 2 | 3 |
|---|---|---|---|
| IC1682 | 1.1 | 0 | 1.1 |
| Ref. No. | S | D | G |
| Q1601 | 0.1 | 167.1 | 1.1 |
| Q1905 | 0.1 | 167.6 | 1.1 |

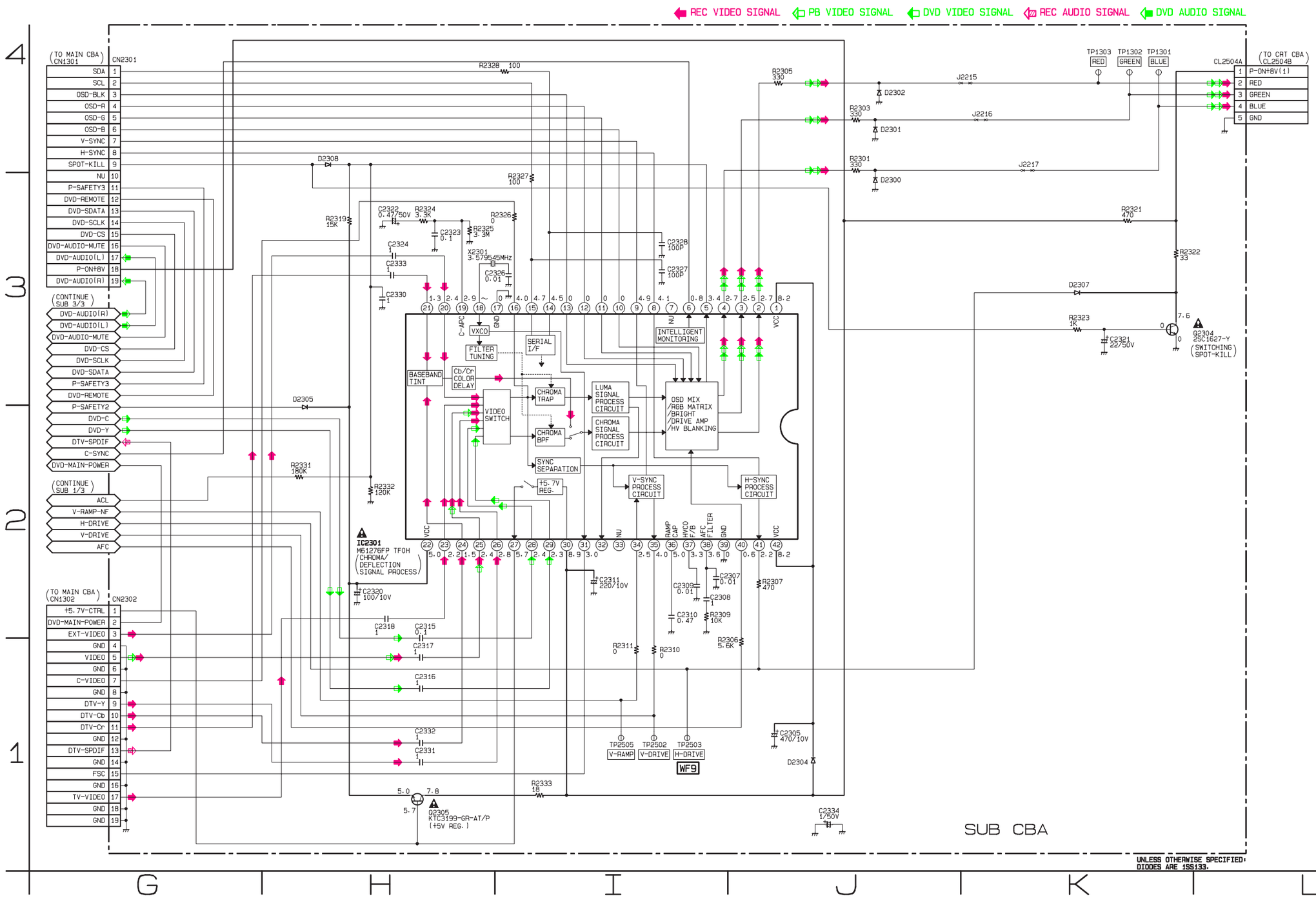
| Ref. No. | E | C | B |
|---|---|---|---|
| Q1221 | 0 | 5.1 | 0 |
| Q1602 | 0 | 1.1 | 0.1 |
| Q1604 | 0 | 0.1 | 0 |
| Q1605 | 0 | 0 | 0 |
| Q1607 | 0 | 2.1 | 0 |
| Q1613 | 0 | 0 | 0.1 |
| Q1614 | 0 | 0 | 0 |
| Q1681 | 0 | 1.1 | 0 |
| Q1688 | 0 | 1.1 | 0 |
| Q1689 | 0 | 1.1 | 0 |
| Q1901 | 1.2 | 1.1 | 0.5 |
| Q1902 | 5.6 | 7.0 | 6.6 |
| Q1903 | 6.8 | 10.3 | 7.4 |
| Q1904 | 0 | 1.1 | 0.7 |
| Q1906 | 0 | 7.4 | 0.1 |
| Q1907 | 0 | 6.8 | 0.1 |
| Q1908 | 0 | 0.1 | 0.7 |



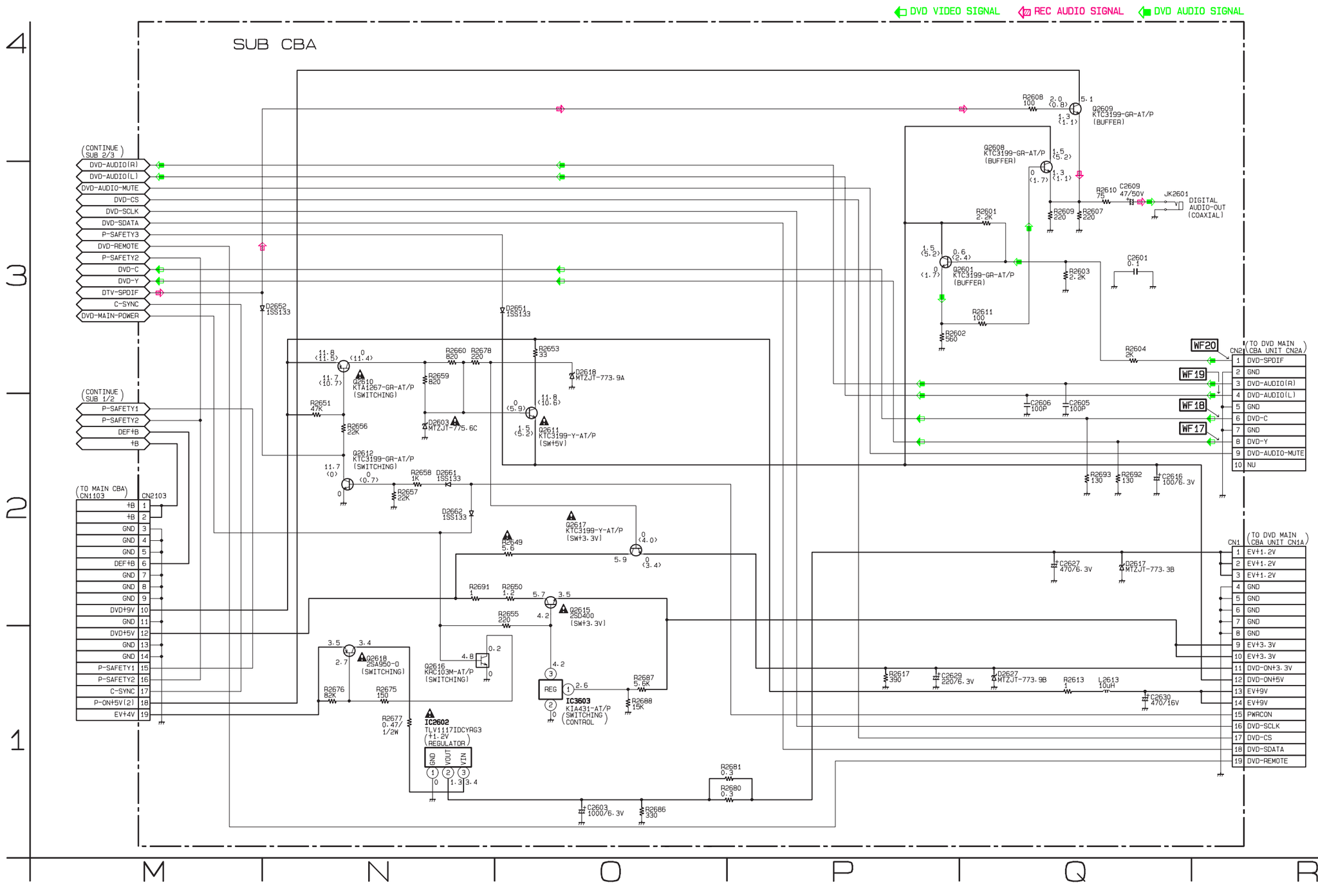
## Sub 1/3 Schematic Diagram < TV/VCR Section >



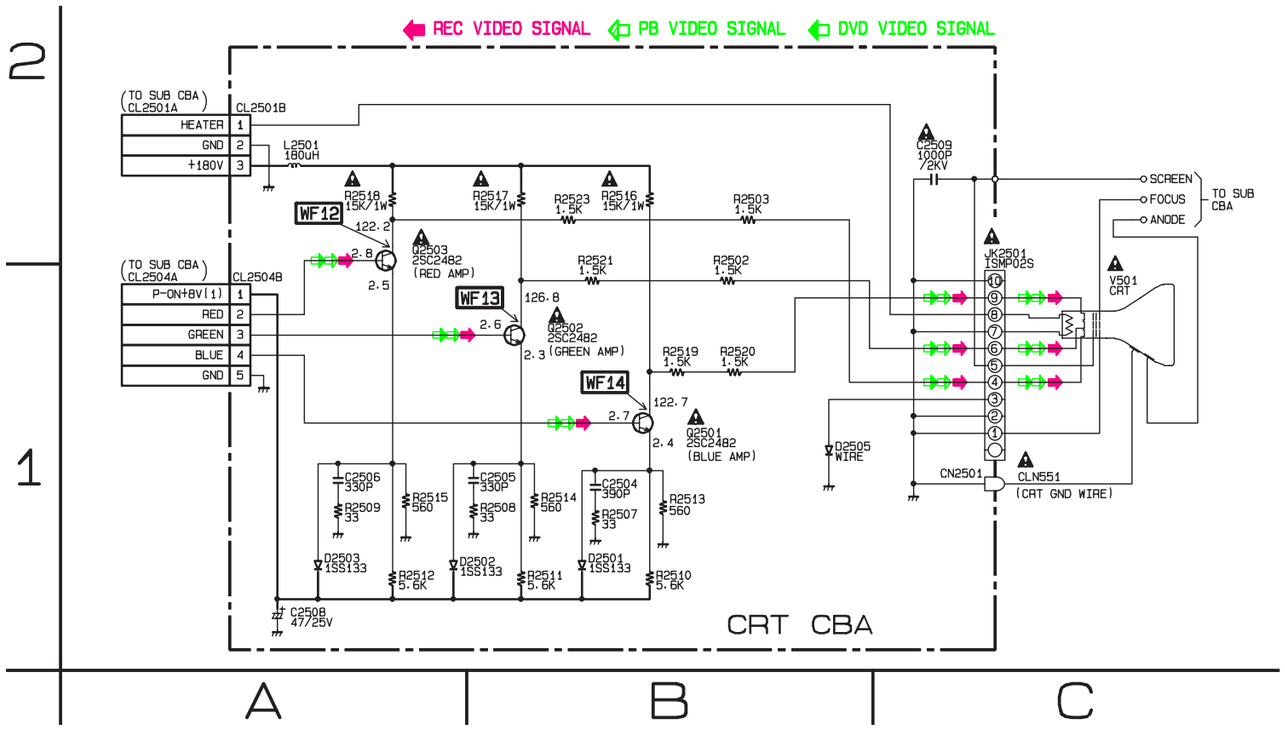
# Sub 2/3 Schematic Diagram < TV/VCR Section >



# Sub 3/3 Schematic Diagram < TV/VCR Section >

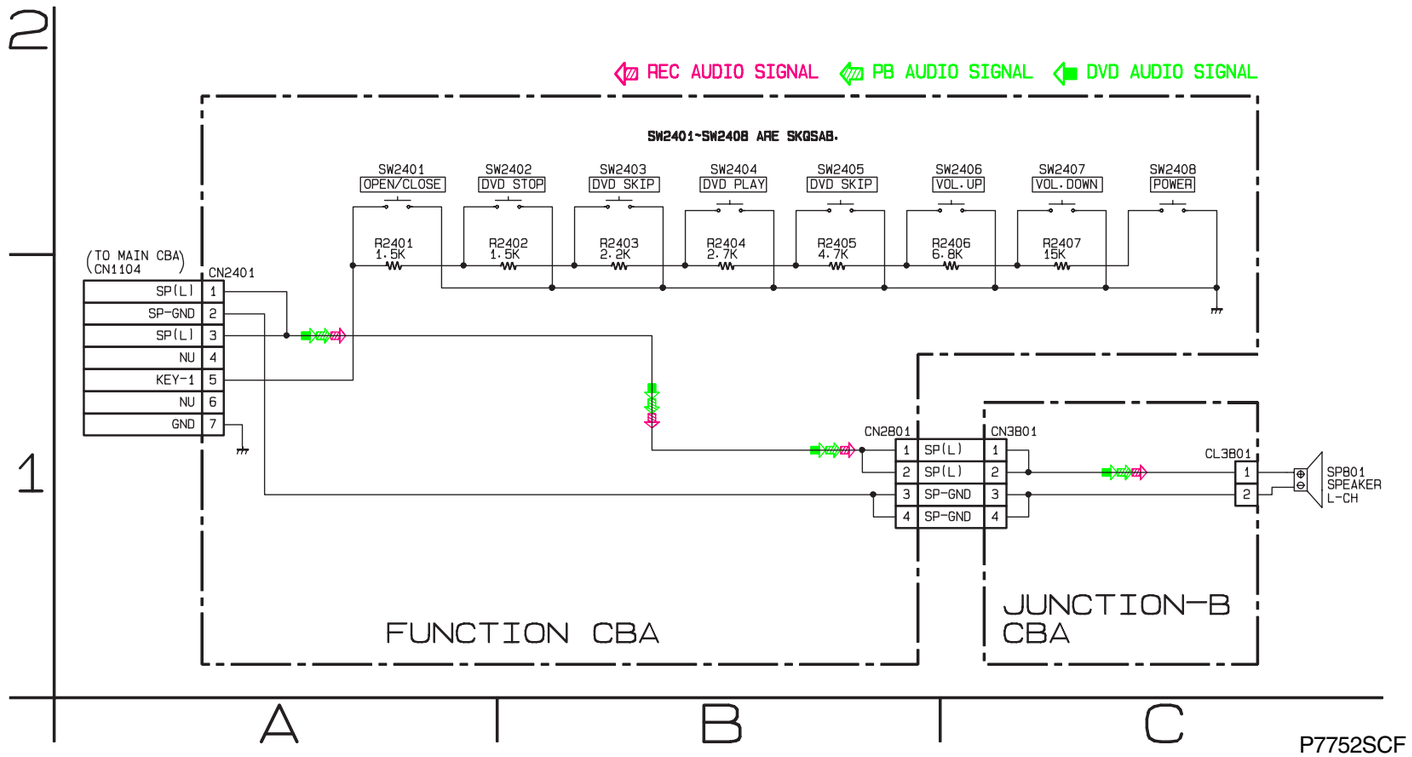


## CRT Schematic Diagram < TV/VCR Section >



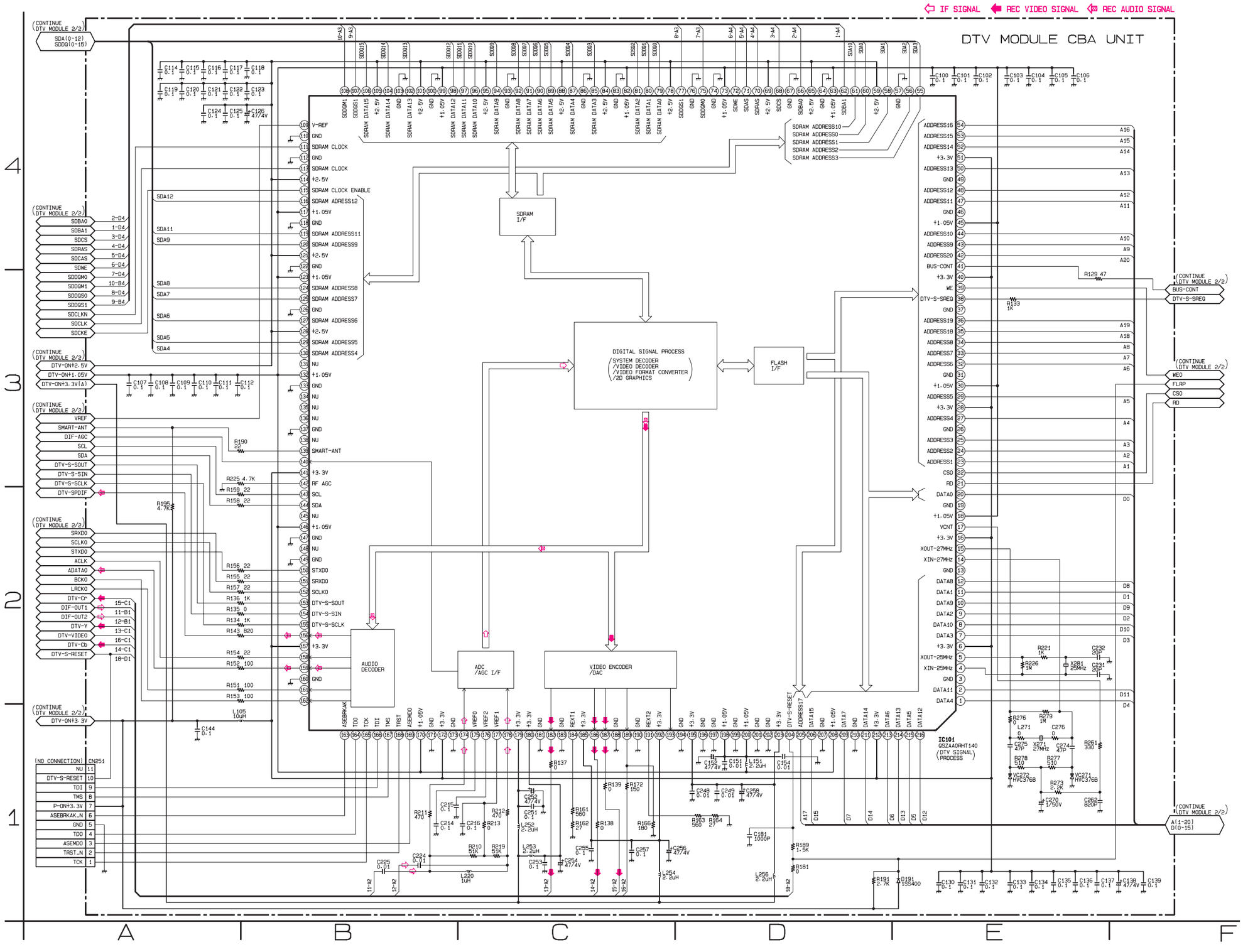

P7752SCCRT

## Function & Junction-B Schematic Diagram < TV/VCR Section >

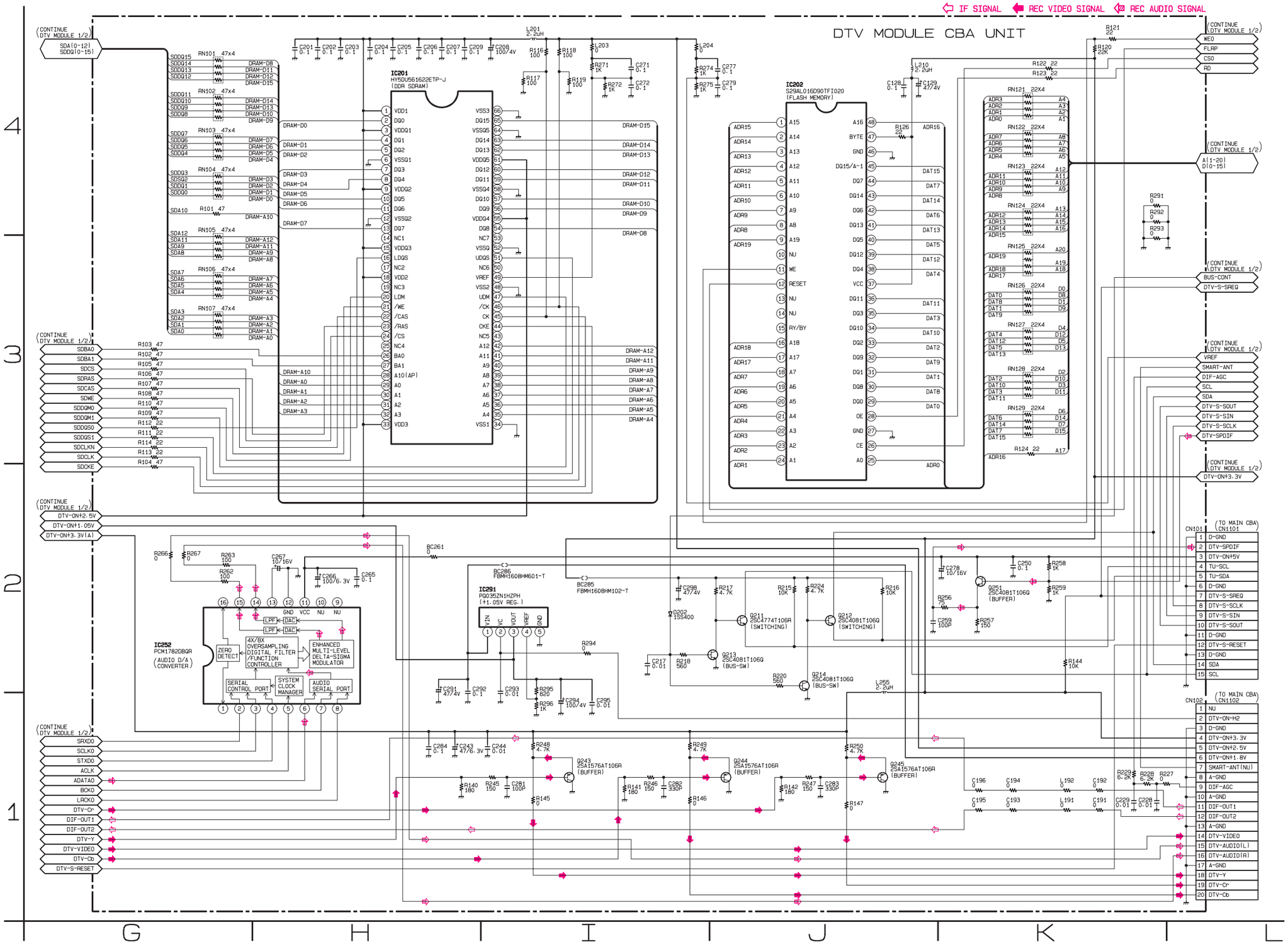



P7752SCF

# DTV Module 1/2 Schematic Diagram < TV/VCR Section >



# DTV Module 2/2 Schematic Diagram < TV/VCR Section >




## VOLTAGE CHART

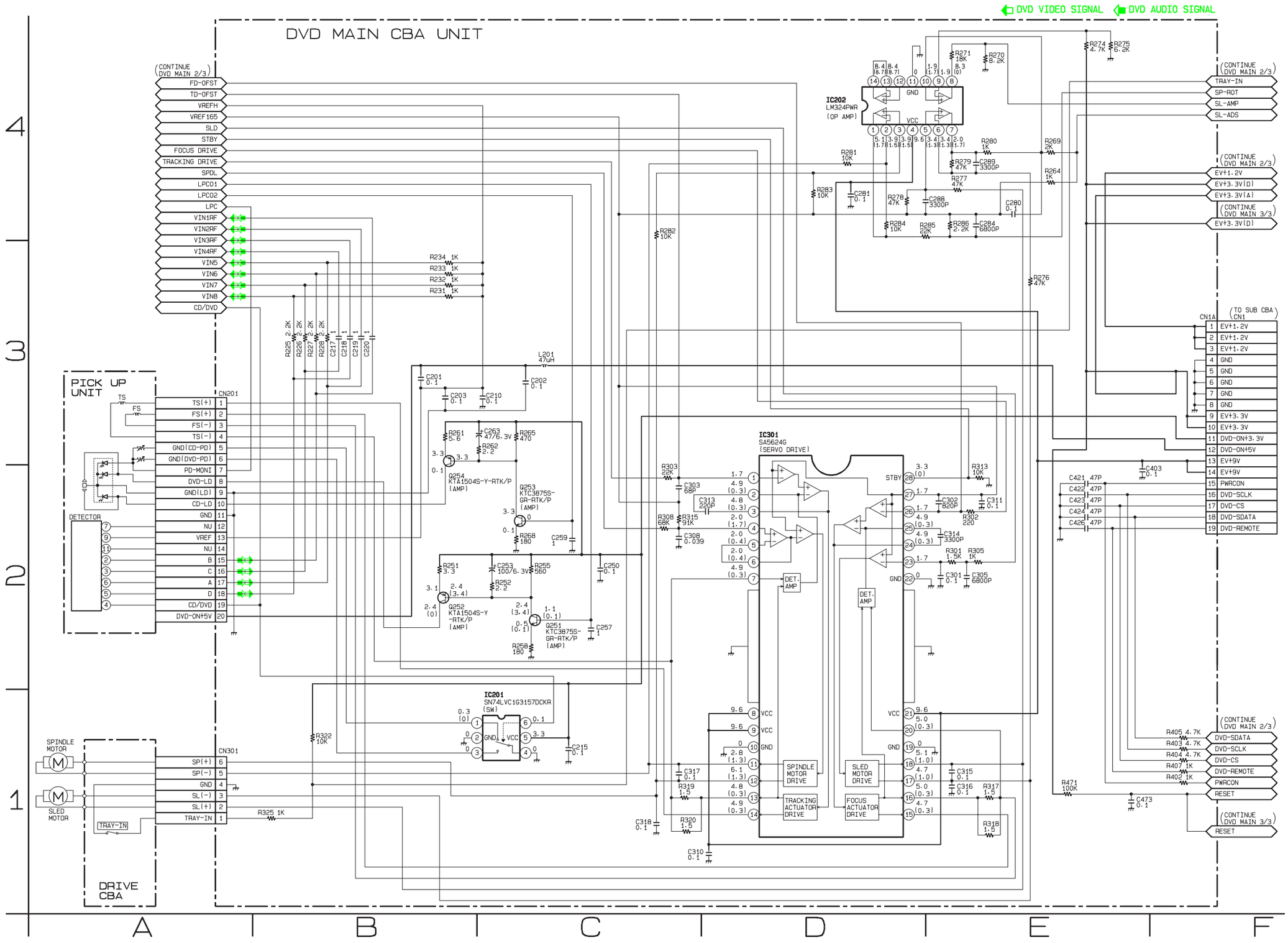
CN101

| Pin No. | Voltage |
|---|---|
| 1 | 0 |
| 2 | 1.9 |
| 3 | 5.2 |
| 4 | 3.4 |
| 5 | 3.4 |
| 6 | 0 |
| 7 | 2.8 |
| 8 | 3.2 |
| 9 | 3.3 |
| 10 | 0.2 |
| 11 | 0 |
| 12 | 3.4 |
| 13 | 0 |
| 14 | 3.2 |
| 15 | 3.2 |

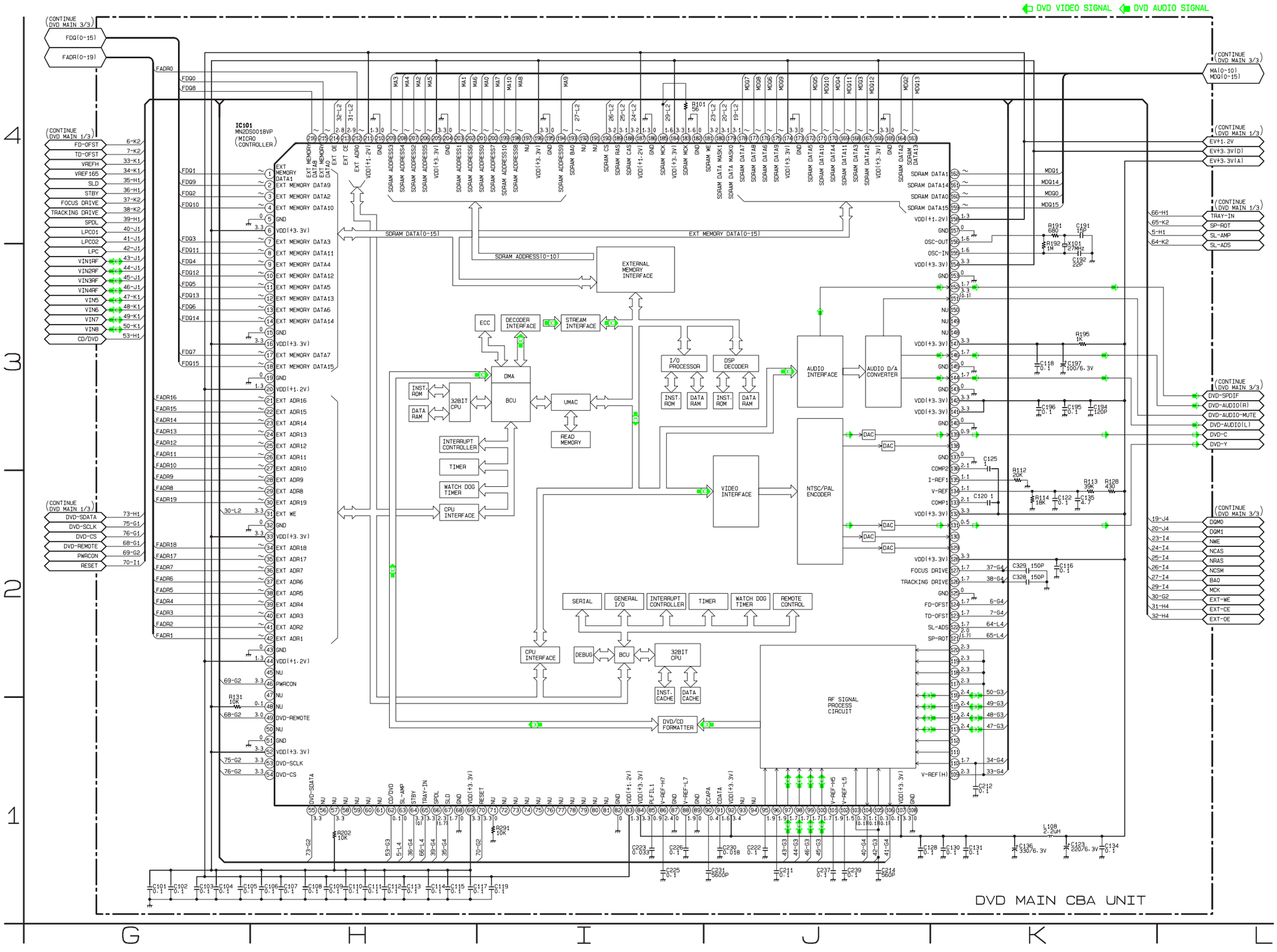
CN102

| Pin No. | Voltage |
|---|---|
| 1 | --- |
| 2 | 4.9 |
| 3 | 0 |
| 4 | 3.4 |
| 5 | 2.6 |
| 6 | 1.9 |
| 7 | --- |
| 8 | 0 |
| 9 | 1.7 |
| 10 | 0 |
| 11 | 0 |
| 12 | 0 |
| 13 | 0 |
| 14 | 2.3 |
| 15 | 2.6 |
| 16 | 2.5 |
| 17 | 0 |
| 18 | ~ |
| 19 | ~ |
| 20 | ~ |

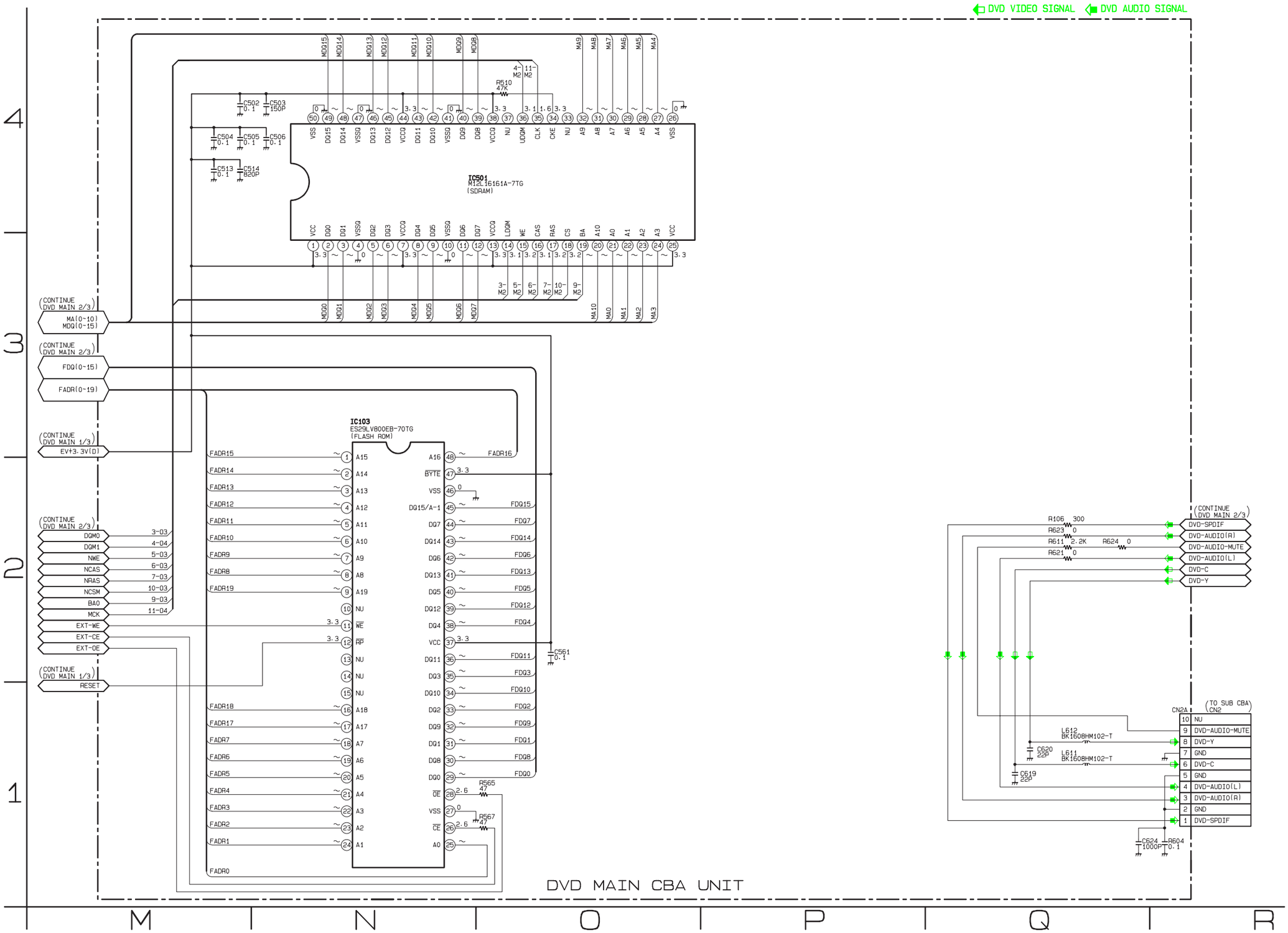
# DVD Main 1/3 Schematic Diagram < DVD Section >



# DVD Main 2/3 Schematic Diagram < DVD Section >



# DVD Main 3/3 Schematic Diagram < DVD Section >



# Main CBA Top View < TV/VCR Section >

4A 125V

**CAUTION ! :** For continued protection against risk of fire, replace only with same type 4 A, 125V fuse.

**ATTENTION :** Utiliser un fusible de rechange de même type de 4A, 125V.

**NOTE:**
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**CAUTION !**
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F1601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

**Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly,when troubleshooting this type power supply circuit, a variable isolation transformer is required.**

TO SENSOR CBA (END-SENSOR)

BP7750F01011

C7A3 / A3 / A3C1 / A30C5

VR1601
+B ADJ

**WF2**
**PIN 49**
**OF IC1401**

**WF4**
**PIN 32**
**OF IC1401**

**WF7**
**PIN 10**
**OF IC1401**

**WF8**
**PIN 9**
**OF IC1401**

**WF6**
**TP1403**
**ENV.**

**WF5**
**TP1401**
**V-OUT**

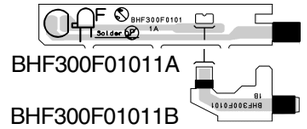
**WF1**
**TP1402**
**RF-SW**

**WF3**
**TP1202**
**CTL-AMP -OUT**

TO SENSOR CBA (START-SENSOR)

P7750TRY
E175216

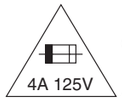
# Sensor CBA Top View



BHF300F01011A

BHF300F01011B

# Main CBA Bottom View < TV/VCR Section >

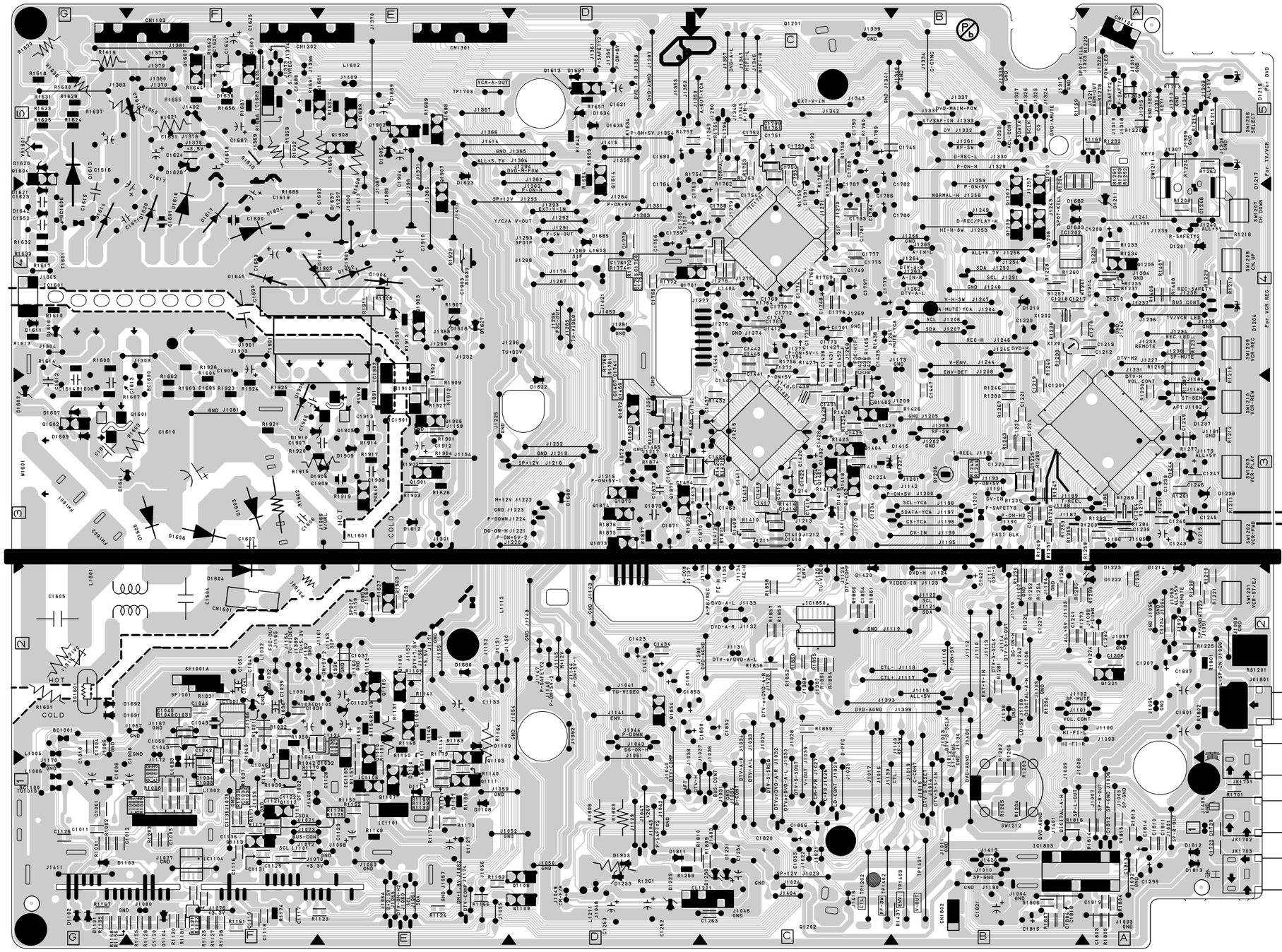



**CAUTION ! :** For continued protection against risk of fire, replace only with same type 4 A, 125V fuse.
**ATTENTION :** Utiliser un fusible de rechange de même type de 4A, 125V.

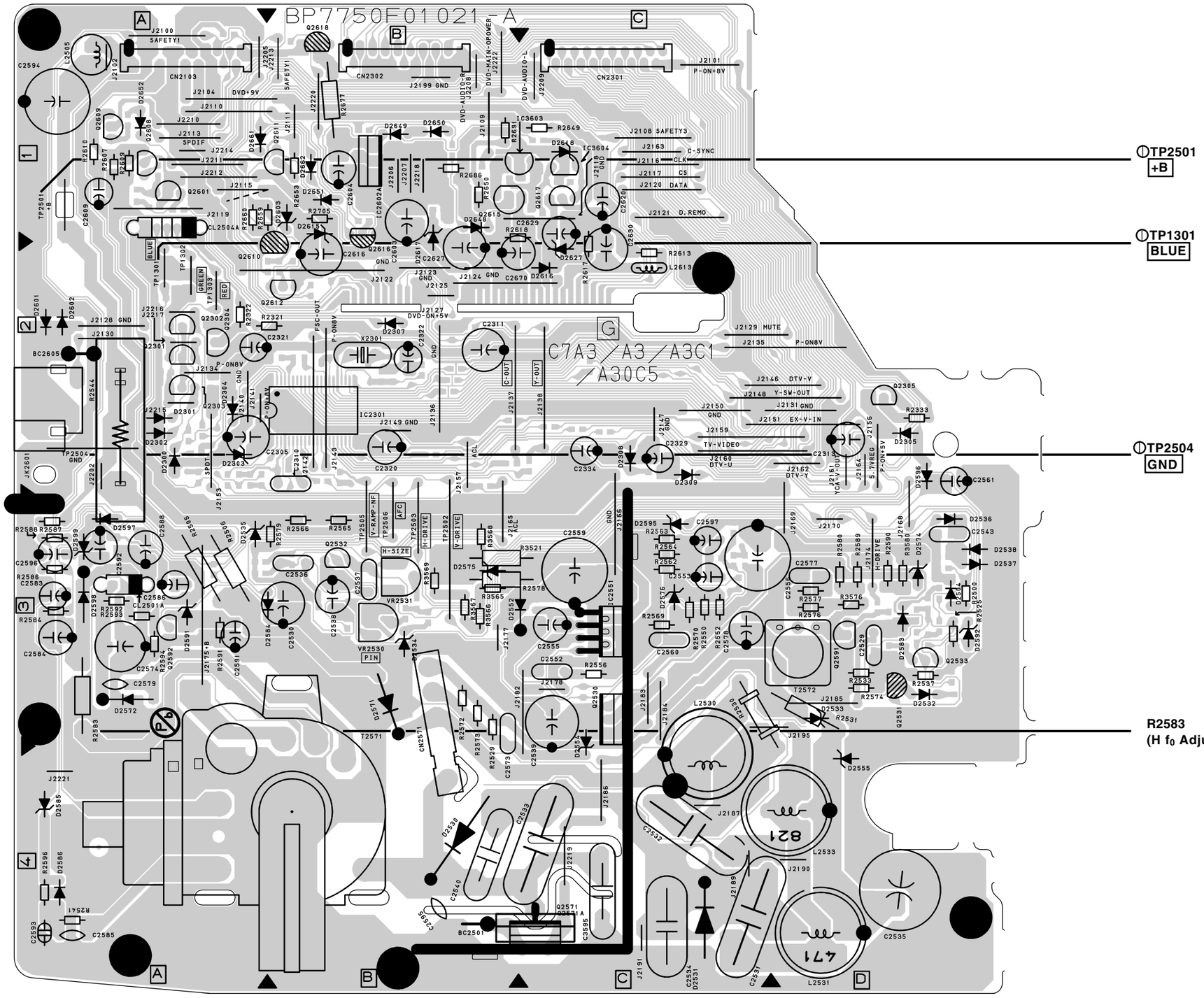
**NOTE:**
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**CAUTION !**
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F1601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

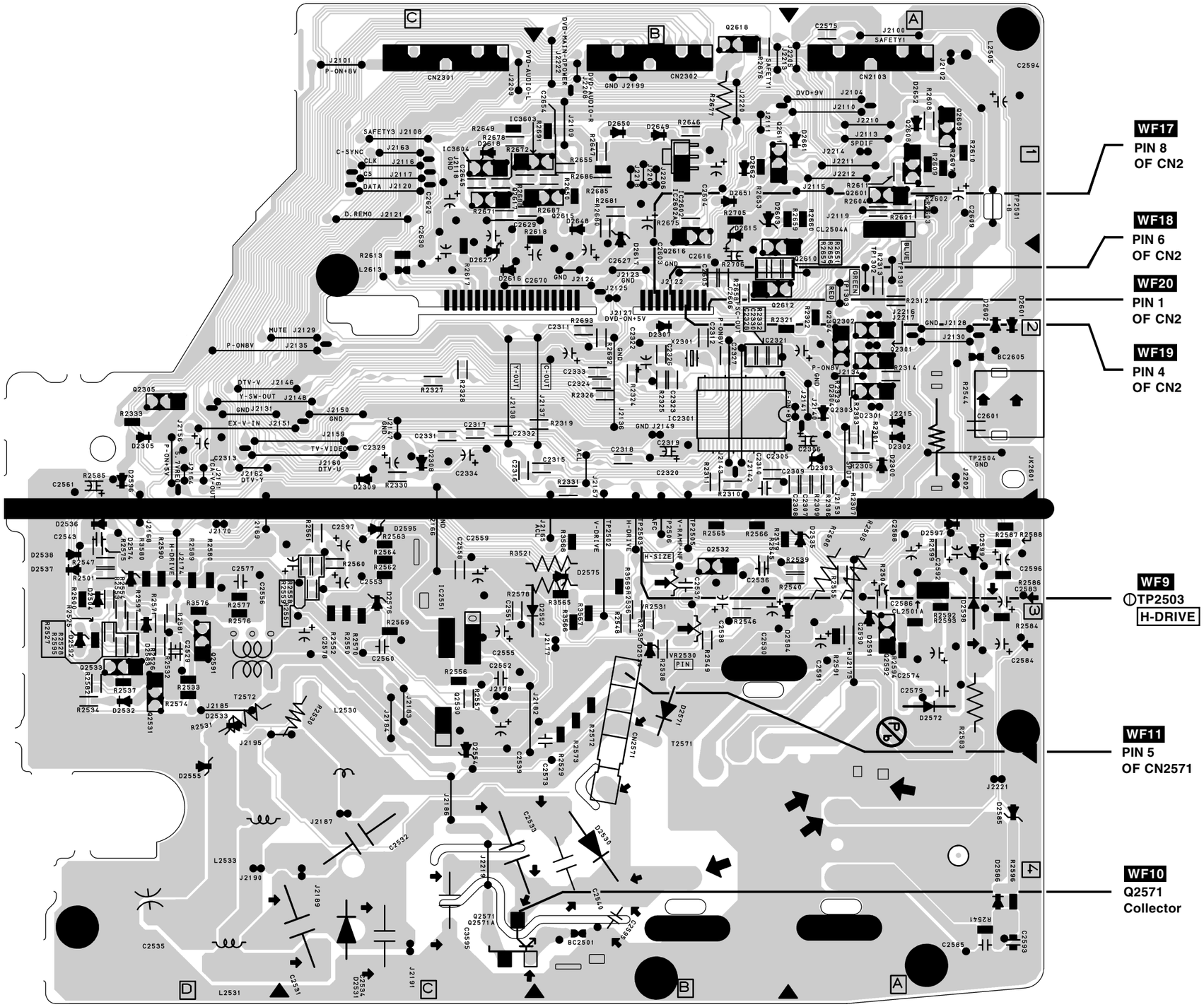
**Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly,when troubleshooting this type power supply circuit, a variable isolation transformer is required.**



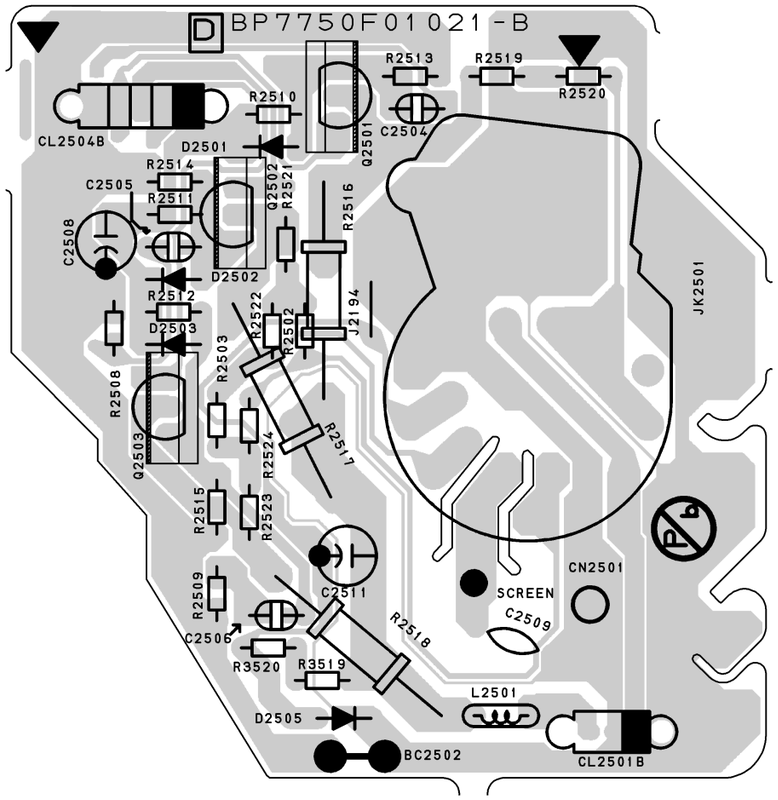
## Sub CBA Top View < TV/VCR Section >



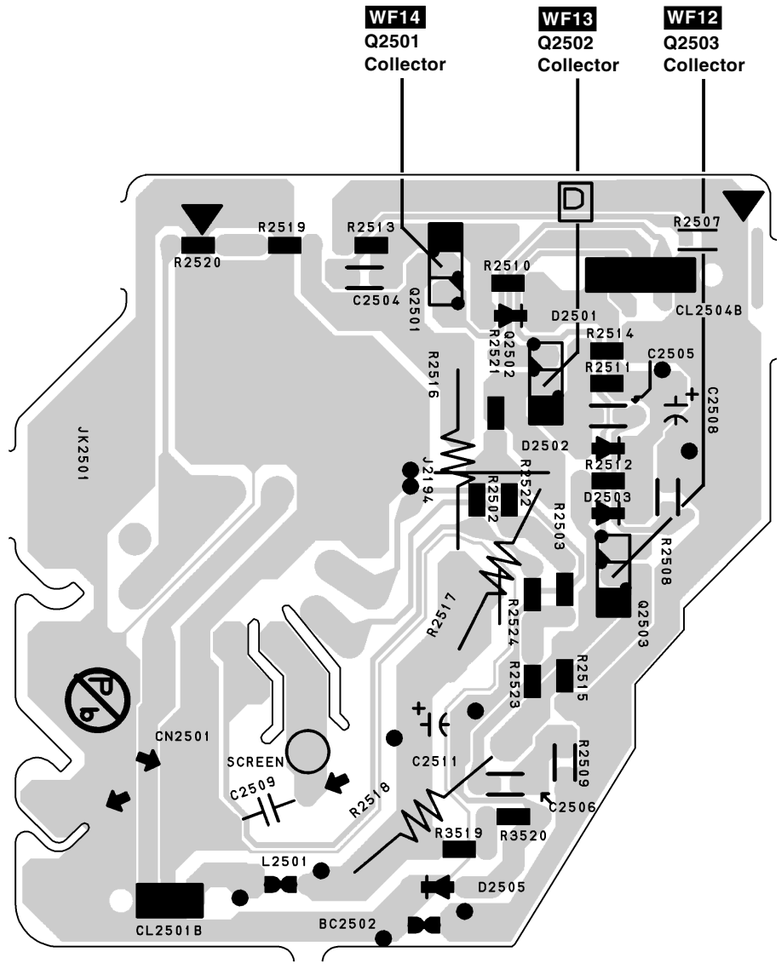
## Sub CBA Bottom View < TV/VCR Section >



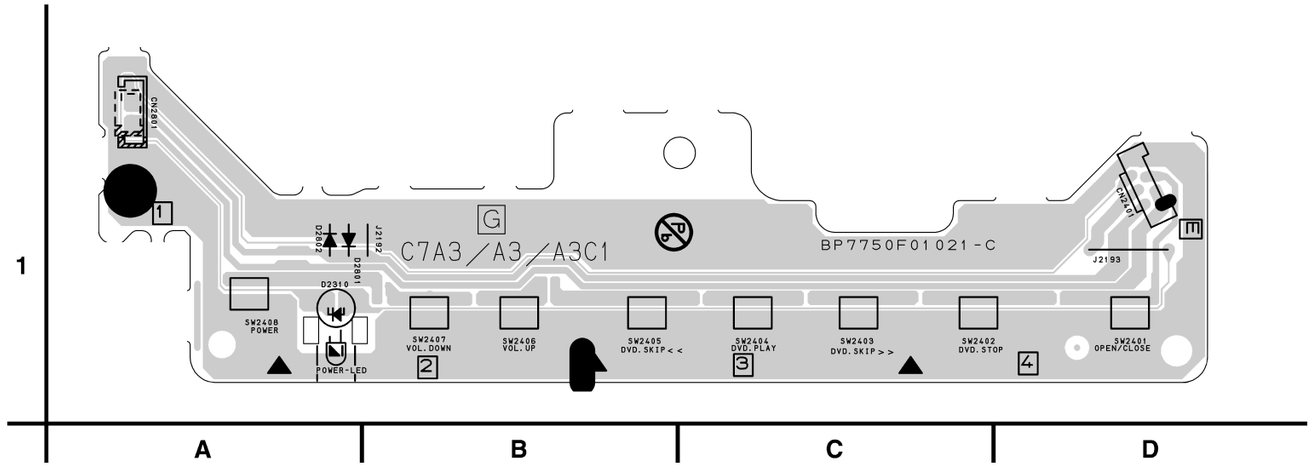
## CRT CBA Top View < TV/VCR Section >



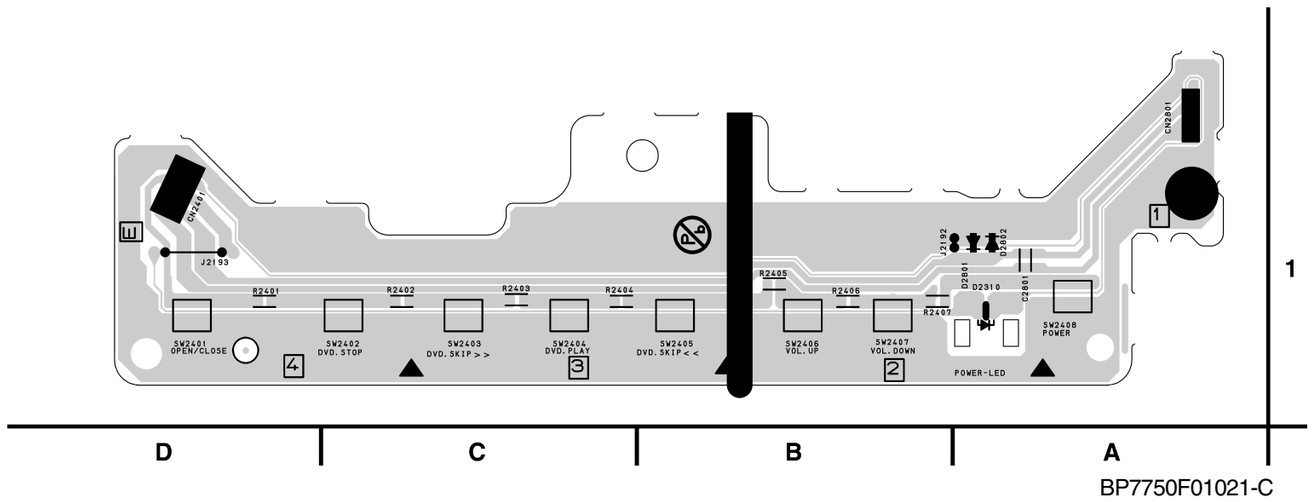

## CRT CBA Bottom View < TV/VCR Section >



## Function CBA Top View < TV/VCR Section >



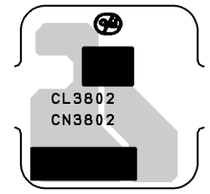

## Function CBA Bottom View < TV/VCR Section >




BP7750F01021-C

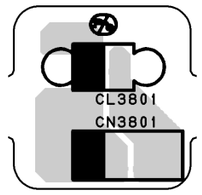
## Junction-A CBA Top View < TV/VCR Section >

## Junction-A CBA Bottom View < TV/VCR Section >

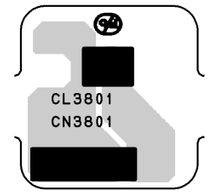



BP7750F01021-D

## Junction-B CBA Top View < TV/VCR Section >



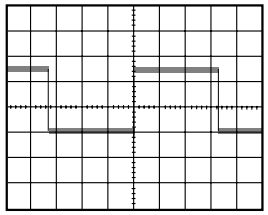

## Junction-B CBA Bottom View < TV/VCR Section >



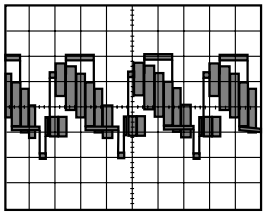

BP7750F01021-E

# WAVEFORMS

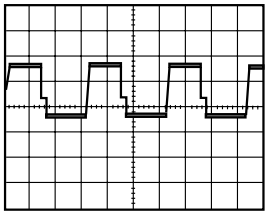
**Input:** NTSC Color Bar Signal (with 1kHz Audio Signal) --- WF1~WF16
DVD Video (Power on (Stop) MODE) --- WF17, WF18
CD (1KHz Play) --- WF19, WF20
**INITIAL POSITION:** Unplug unit from AC outlet for at least five minutes, reconnect to AC outlet and then turn power on.
**(Brightness---Center Color---Center Tint---Center Contrast---Approx 70%)**



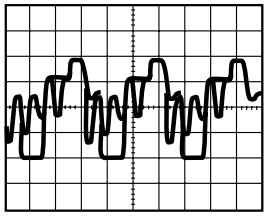
**WF1** 1DIV: 2V 5ms
TP1402 RF-SW



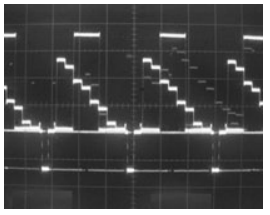
**WF5** 1DIV: 0.5V 20µs
TP1401 V-OUT



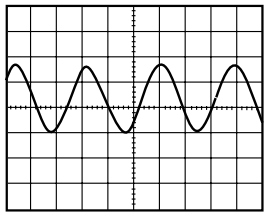
**WF9** 1DIV: 2V 20µs
TP2503 H-DRIVE



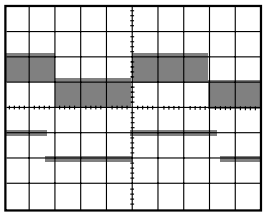
**WF13** 1DIV: 20V 20µs
Q2502 COLLECTOR



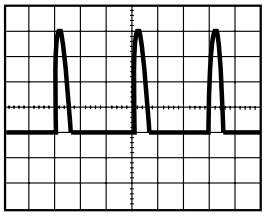
**WF17** 1DIV: 0.2V 20µs
CN2 PIN 8



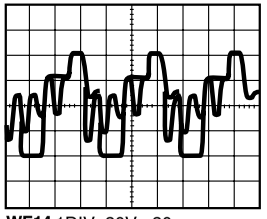
**WF2** 1DIV: 0.2V 0.1µs
IC1401 Pin 49



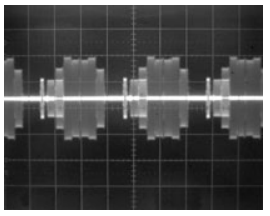
Upper: **WF6** Lower: **WF1**
1DIV: 0.2V 2DIV: 5V 5ms
TP1403 ENV. TP1402 RF-SW



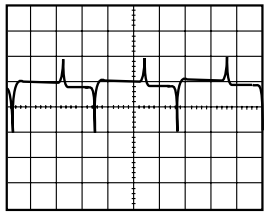
**WF10** 1DIV: 200V 20µs
Q2571 COLLECTOR



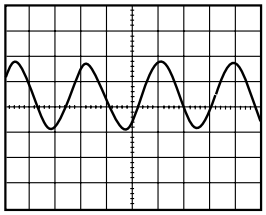
**WF14** 1DIV: 20V 20µs
Q2501 COLLECTOR



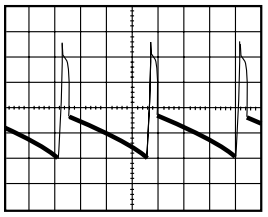
**WF18** 1DIV: 0.2V 20µs
CN2 PIN 6



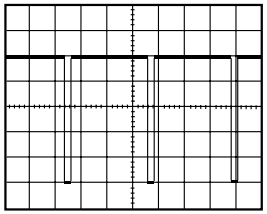
**WF3** 1DIV: 1V 10ms
TP1202 CTL-AMP-OUT



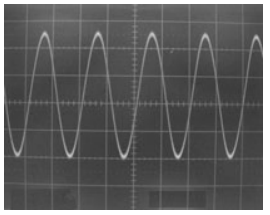
**WF7** 1DIV: 0.5V 0.5ms
IC1401 PIN10



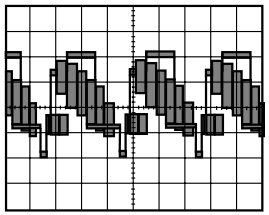
**WF11** 1DIV: 10V 5ms
CN2571 PIN 5



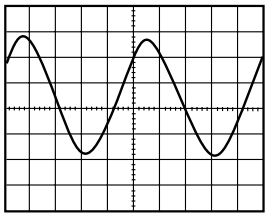
**WF15** 1DIV: 1V 20µs
IC1201 PIN 58



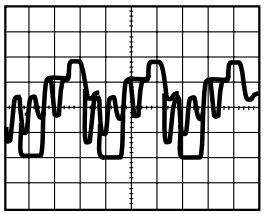
**WF19** 1DIV: 0.5V 0.5ms
CN2 PIN 4



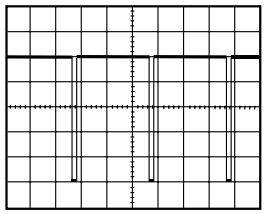
**WF4** 1DIV: 0.25V 20µs
IC1401 Pin 32



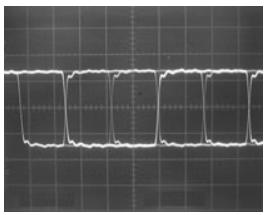
**WF8** 1DIV: 0.5V 0.5ms
IC1401 PIN9



**WF12** 1DIV: 20V 20µs
Q2503 COLLECTOR

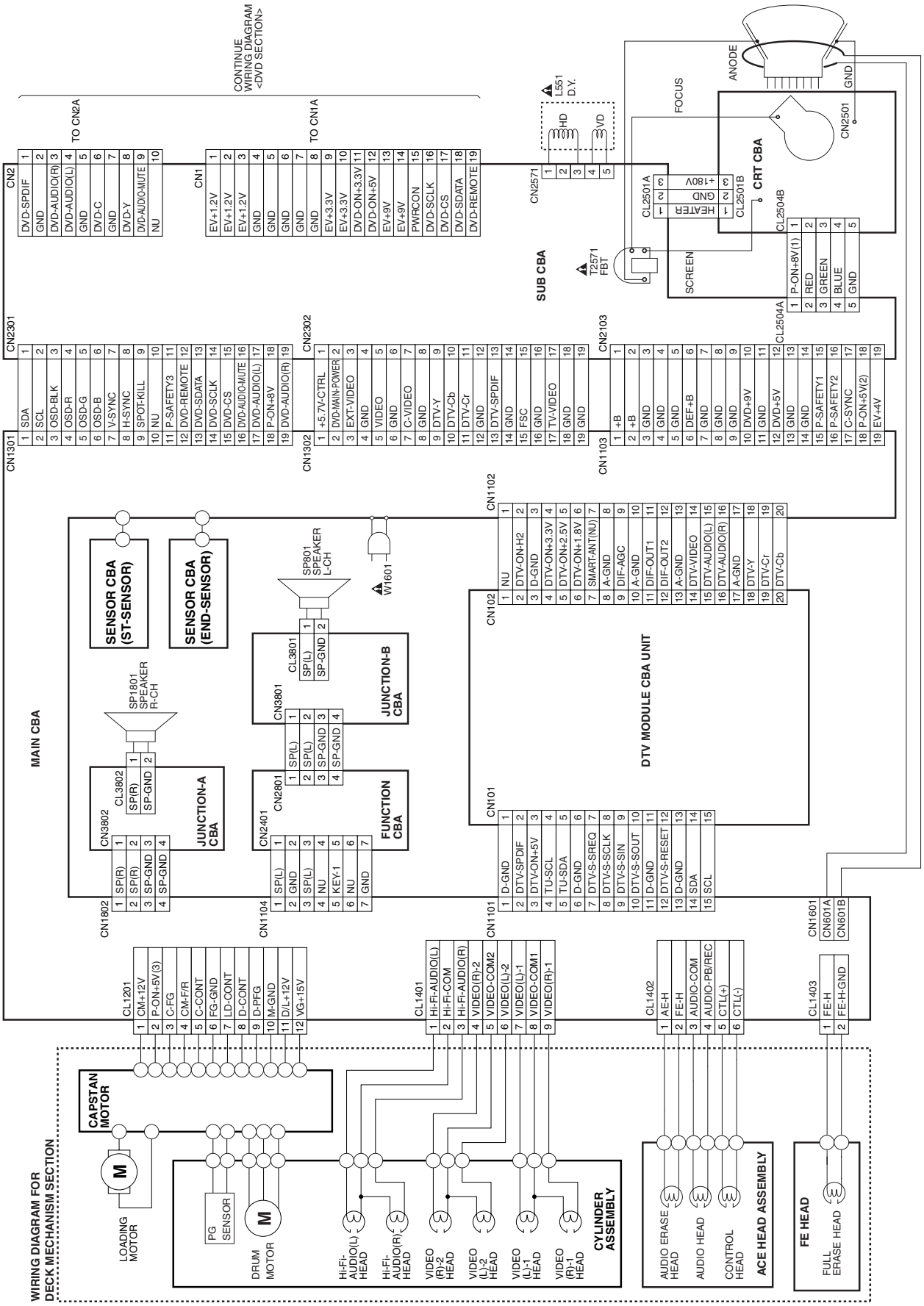


**WF16** 1DIV: 1V 5ms
IC1201 PIN 59

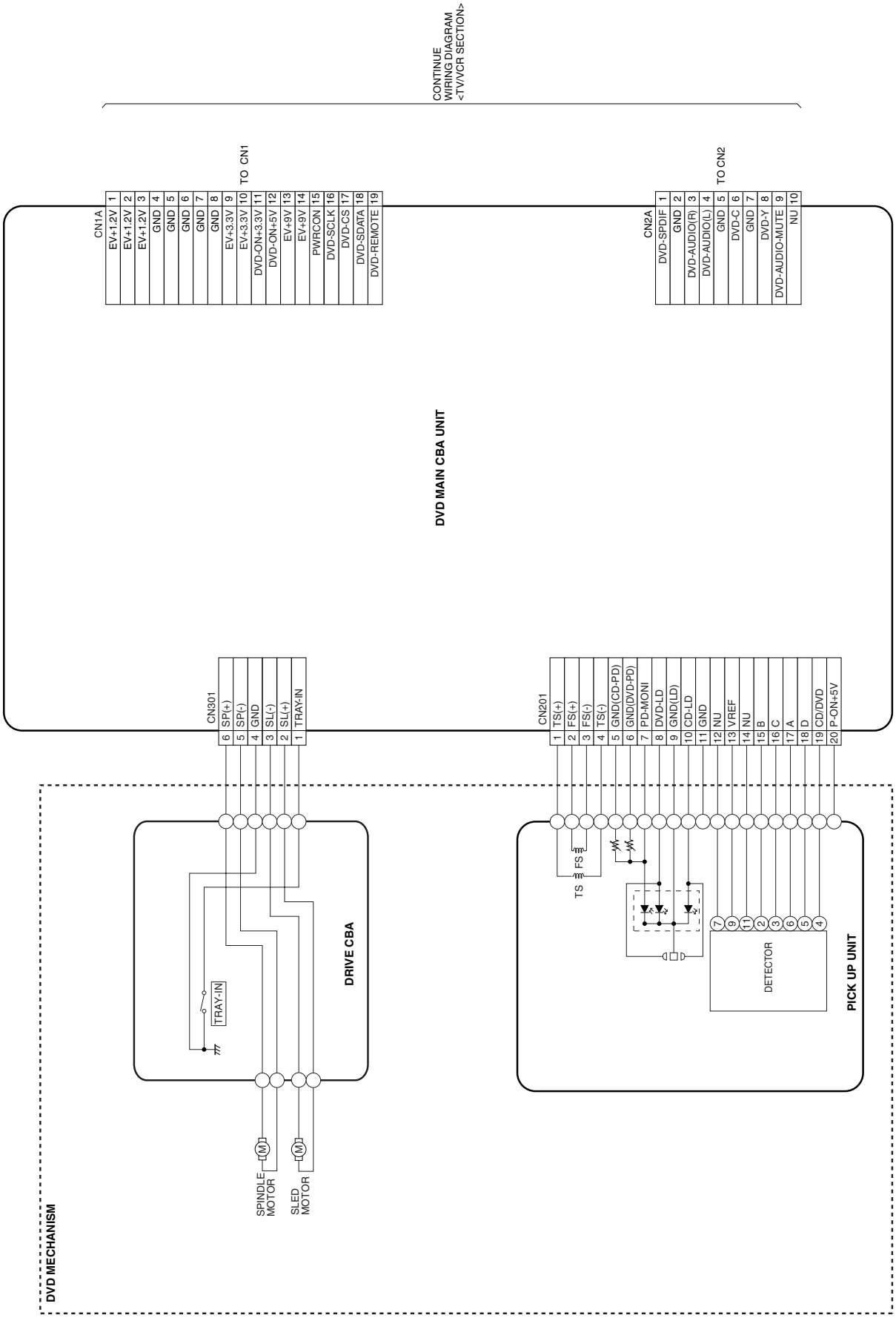


**WF20** 1DIV: 1V 0.1µs
CN2 PIN 1

# WIRING DIAGRAM < TV/VCR Section >



# WIRING DIAGRAM < DVD Section >



# SYSTEM CONTROL TIMING CHARTS

## < TV/VCR Section >

### Mode SW: LD-SW

| LD-SW Position detection A/D Input voltage Limit (Calculated voltage) | Symbol |
|---|---|
| 3.76 V ~ 4.50 V (4.12 V) | EJ |
| 4.51 V ~ 5.00 V (5.00 V) | CL |
| 0.00 V ~ 0.25 V (0.00 V) | SB |
| 1.06 V ~ 1.50 V (1.21 V) | TL |
| 0.66 V ~ 1.05 V (0.91 V) | FB |
| 1.99 V ~ 2.60 V (2.17 V) | SF |
| 1.51 V ~ 1.98 V (1.80 V) | SM |
| 3.20 V ~ 3.75 V (3.40 V) | AU |
| 0.26 V ~ 0.65 V (0.44 V) | AL |
| 4.51 V ~ 5.00 V (5.00 V) | SS |
| 2.61 V ~ 3.19 V (2.97 V) | RS |

**Note:**

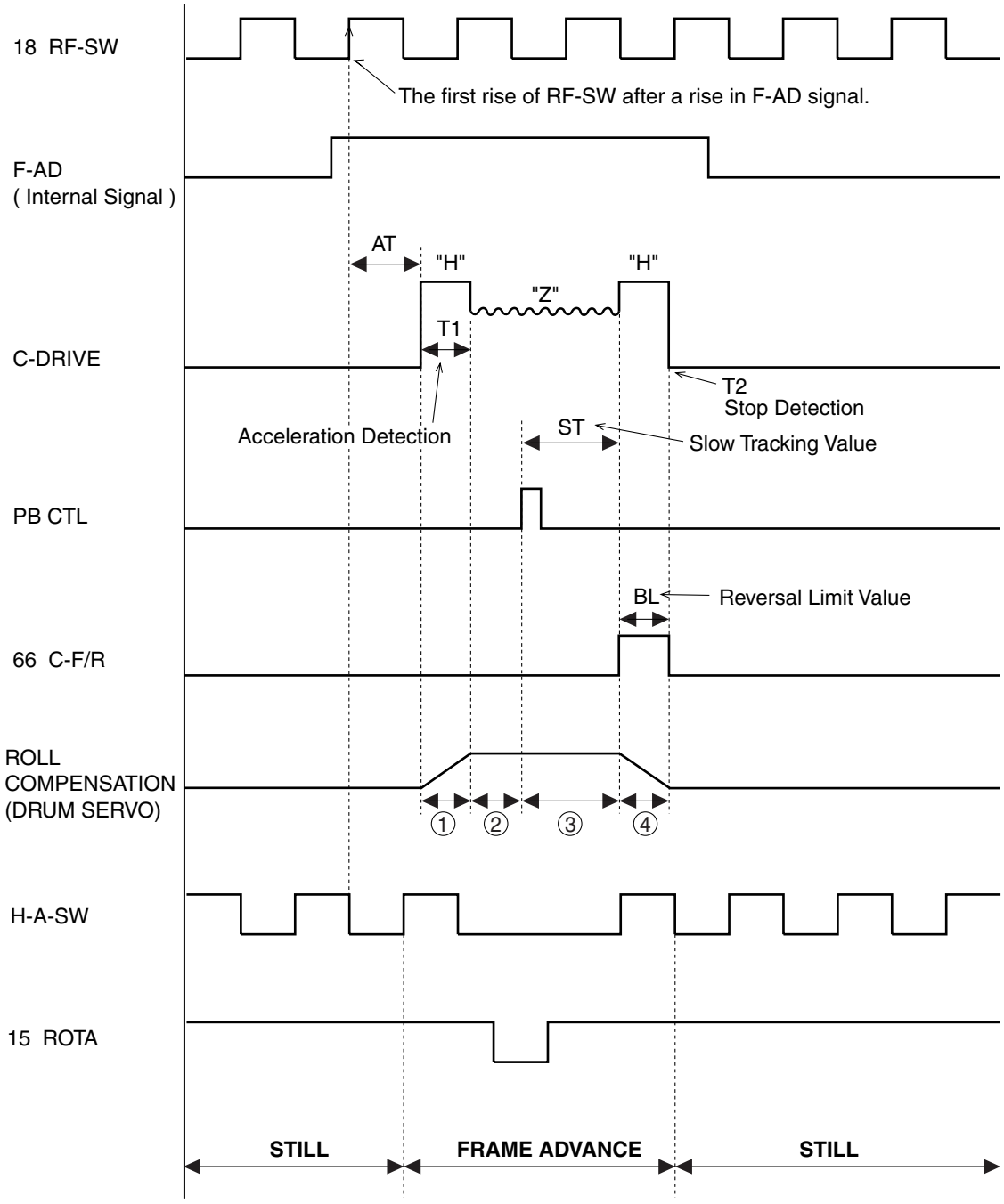
**Note:** EJ → RS: Loading FWD (LM-FWD / REV “H”)
RS → EJ: Loading REV (LM-FWD / REV “L”)
Stop (A) = Loading
Stop (B) = Unloading

**Note:**

| Symbol | Loading Status |
|---|---|
| EJ | Eject |
| CL | Eject ~ REW Reel |
| SB | REW Reel ~ Stop (B) |
| TL | Stop (B) ~ Brake Cancel |
| FB | Brake Cancel ~ FF / REW |
| SF | FF / REW ~ Stop (M), (FF / REW) |
| SM | Stop (M), (FF / REW) ~ Stop (A) |
| AU | Stop (A) ~ Play / REC |
| AL | Play / REC ~ Still / Slow |
| SS | Still / Slow ~ RS (REW Search) |
| RS | RS (REW Search) |

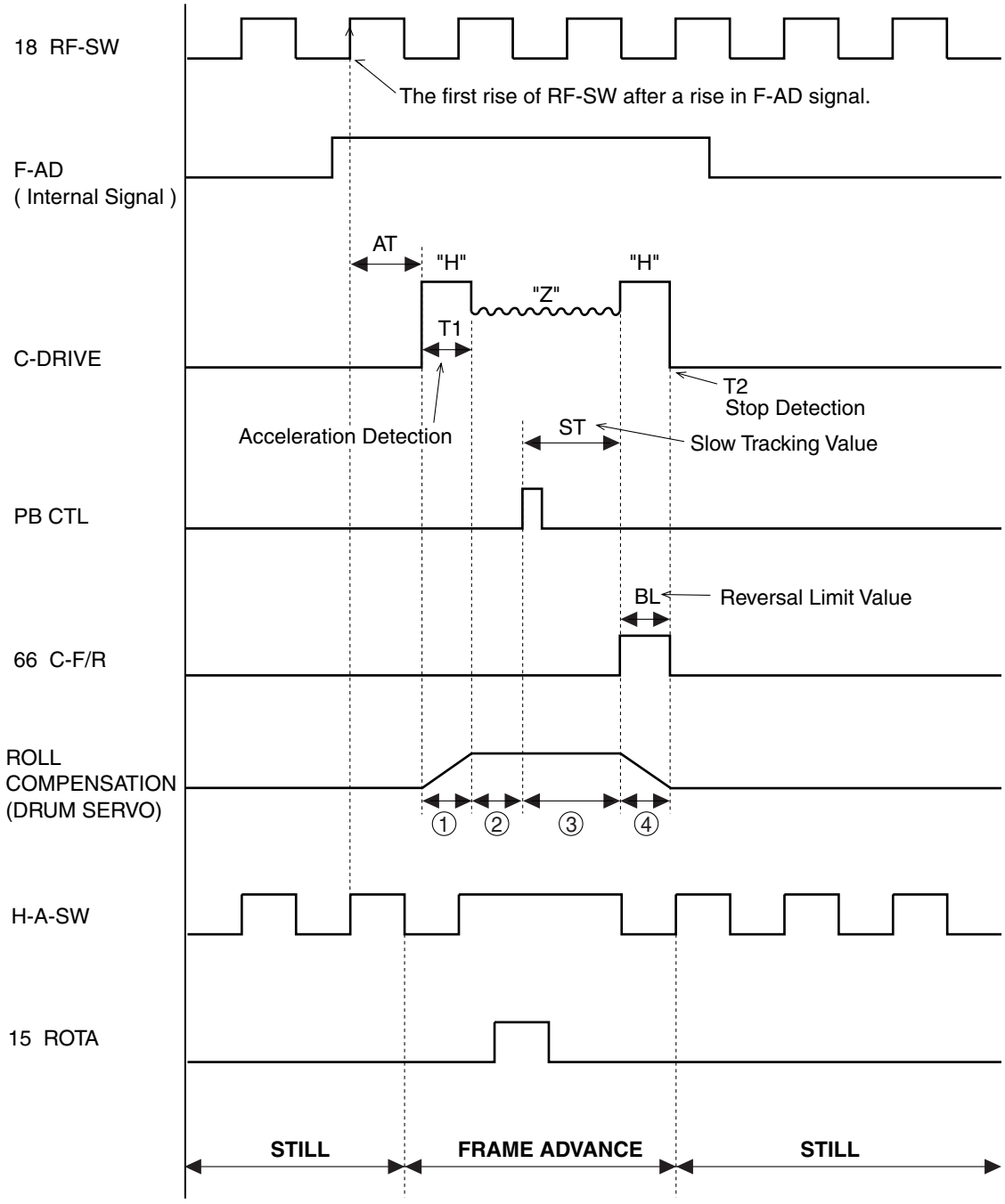
## Chart 1

1) SP MODE

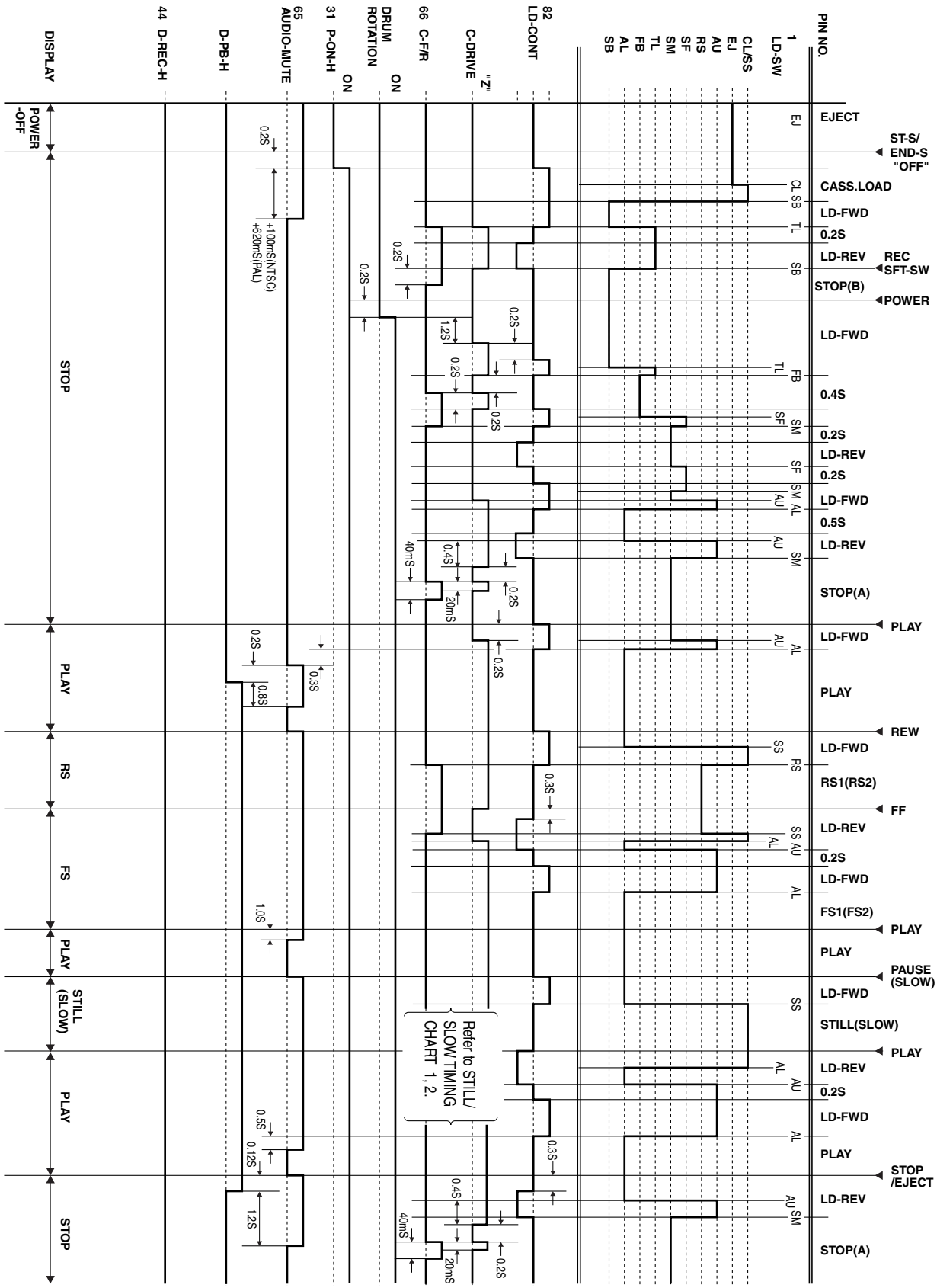


## Chart 2

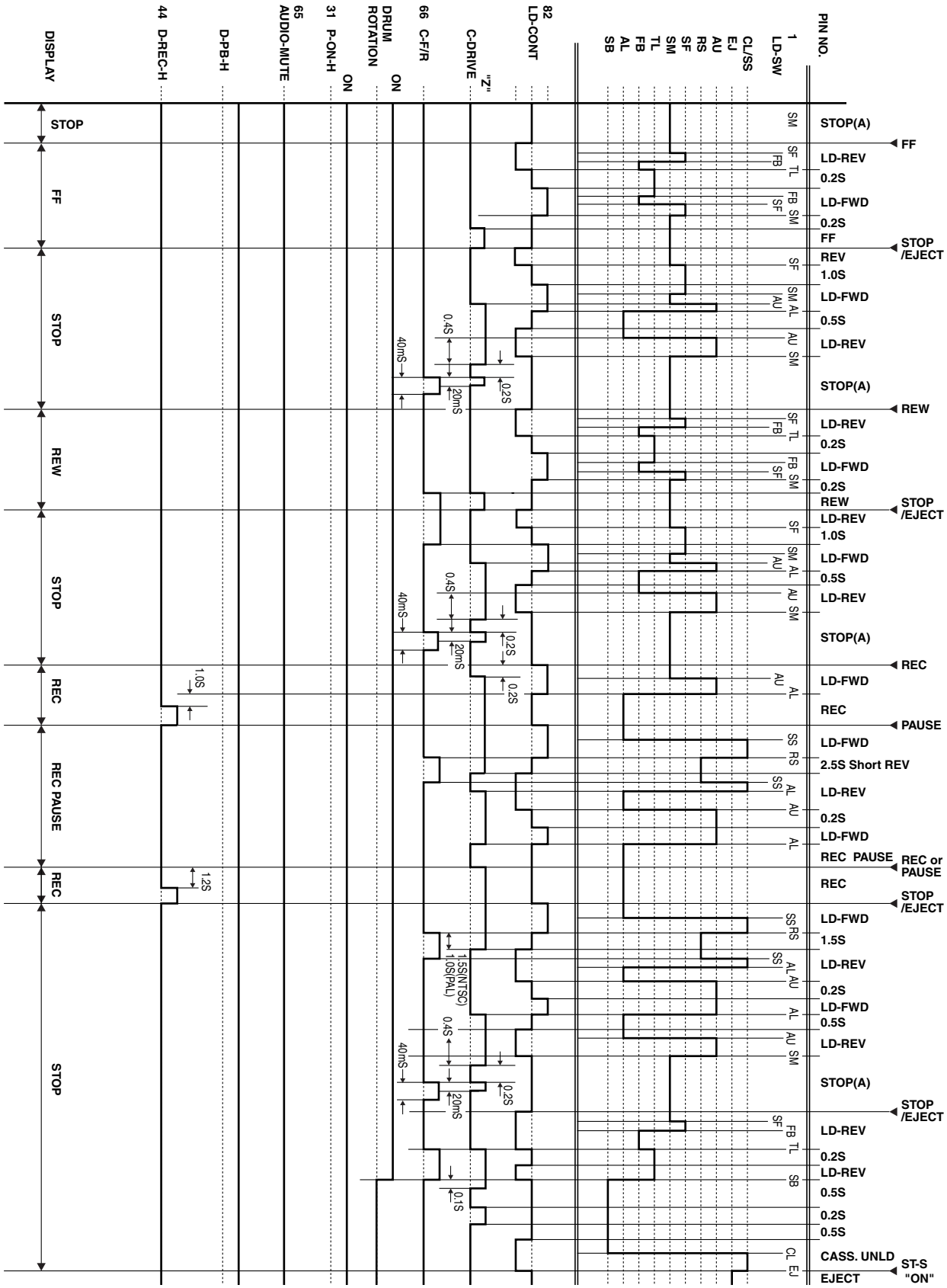
2) LP/EP MODE



## Chart 3

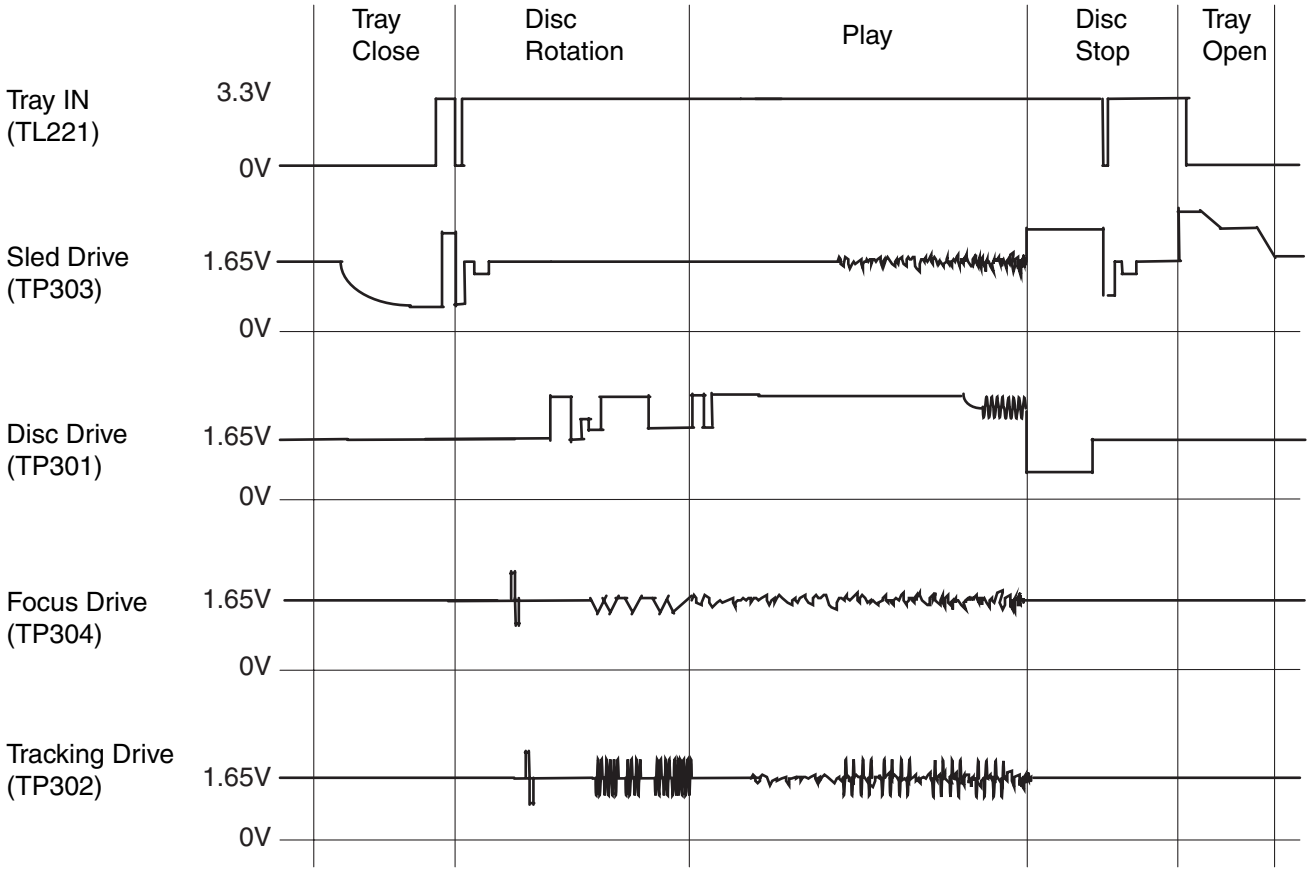

1. EJECT (POWER OFF) -> CASSETTE IN (POWER ON) -> STOP(B) -> STOP(A) -> PLAY -> RS -> FS -> PLAY -> STILL/SLOW -> PLAY -> STOP(A)
PIN NO.
1 LD-SW
EJ
CL/SS
EJ
AU
RS
SF
SM
TL
FB
AL
SB
82 LD-CONT
C-DRIVE "Z"
66 C-F/R
DRUM ROTATION
31 P-ON-H
65 AUDIO-MUTE
D-PB-H
44 D-REC-H
DISPLAY
POWER -OFF
EJECT
ST-S/ END-S "OFF"
CASS.LOAD
LD-FWD
0.2S
LD-REV
REC SFT-SW
STOP(B)
POWER
LD-FWD
0.4S
0.2S
LD-REV
0.2S
LD-FWD
0.5S
LD-REV
STOP(A)
PLAY
LD-FWD
PLAY
REW
LD-FWD
RS1(RS2)
FF
LD-REV
0.2S
LD-FWD
FS1(FS2)
PLAY
PLAY
PAUSE (SLOW)
LD-FWD
STILL(SLOW)
PLAY
LD-REV
0.2S
LD-FWD
PLAY
STOP /EJECT
LD-REV
STOP(A)
STOP
PLAY
RS
FS
PLAY
STILL (SLOW)
PLAY
STOP
0.2S
+100mS(NTSC)
+620mS(PAL)
1.2S
40mS
20mS
0.8S
0.3S
1.0S
0.5S
0.12S
Refer to STILL/ SLOW TIMING CHART 1, 2.

## Chart 4


2. STOP(A) -> FF -> STOP(A) -> REW -> STOP(A) -> REC -> PAUSE -> PAUSE or REC -> STOP(A) -> EJECT
PIN NO.
1 LD-SW
CL/SS
EJ
AU
RS
SF
SM
TL
FB
AL
SB
82 LD-CONT
C-DRIVE "Z"
66 C-F/R
DRUM ROTATION
31 P-ON-H
65 AUDIO-MUTE
D-PB-H
44 D-REC-H
DISPLAY
STOP(A)
FF
LD-REV
0.2S
LD-FWD
REV
1.0S
0.5S
REW
2.5S Short REV
REC
REC PAUSE
1.5S(NTSC)
1.0S(PAL)
0.4S
40mS
20mS
0.1S
CASS. UNLD
EJECT
ST-S "ON"
STOP
/EJECT
PAUSE
REC or PAUSE
ON

## < DVD Section >

Tray Close ~ Play / Play ~ Tray Open



# IC PIN FUNCTION DESCRIPTIONS

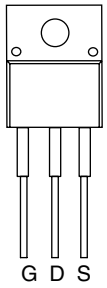
## IC1201 (TV/VCR Micro Controller IC)

| Pin No. | Signal Name | Function |
|---|---|---|
| 1 | LD-SW | Loading Switch Input |
| 2 | DVD-LED | DVD LED Control Output |
| 3 | P-SAFETY 2 | Power Supply Failure Detection 2 |
| 4 | ST/SAP-IN | Tuner Stereo/Sap Detector Signal Input |
| 5 | KEY-0 | Key Input 0 |
| 6 | KEY-1 | Key Input 1 |
| 7 | END-SENS | End-Sensor |
| 8 | AFT | AFT Voltage Input |
| 9 | ST-SENS | Start-Sensor |
| 10 | V-ENV | Video Envelope Input |
| 11 | VOLUME | Volume Control Signal Output |
| 12 | SP-MUTE | Speaker Mute Signal Output |
| 13 | DV-SYNC | Artificial Vertical Sync Output |
| 14 | REMOTE | Remote Control Signal Input |
| 15 | ROTA | Color Phase Rotary Changeover Signal |
| 16 | V-H-SW | Video Head Amp Switching Pulse |
| 17 | ENV-DET | Envelope Comparator Signal |
| 18 | RF-SW | Video Head Switching Pulse |
| 19 | Hi-Fi-H-SW | HiFi Audio Head Switching Pulse |
| 20 | D-REC /PB-H | Delayed Record/Playback Control Signal |
| 21 | REC-LED | REC LED Control Signal |
| 22 | NORMAL-H | Audio Mode Input Signal |
| 23 | NU | Not Used |
| 24 | AUDIO-MUTE | Audio Mute Signal Output |
| 25 | DVD-REMOTE | Remote Control Signal Output to DVD |
| 26 | TV/VCR-LED | TV/VCR LED Control Signal |
| 27 | NU | Not Used |
| 28 | DTV-ON-H2 | DTV On Signal 2 at High |
| 29 | D-REC /PB-L | Delayed Record/Playback Control Signal |
| 30 | DTV-ON-H | DTV On Signal at High |
| 31 | P-ON-H | Power On Signal at High |
| 32 | BUS-CONT | Bus Control |
| 33 | REC-SAFETY | Record Protection Tab Detection |
| 34 | RESET | System Reset Signal (Reset = “L”) |
| 35 | XC-IN | Sub Clock (32kHz) |
| 36 | XC-OUT | Sub Clock (32kHz) |
| 37 | TIMER+5V | VCC |
| 38 | X-IN | Main Clock (10.6MHz) |
| 39 | X-OUT | Main Clock (10.6MHz) |
| 40 | GND | GND |
| 41 | SPOT-KILL | Counter Measure for Spot |
| 42 | DVD-MAIN-POWER | Power On Signal at High for DVD |
| 43 | CLKSEL | Clock Select (GND) |
| 44 | D-REC-H | Delayed Record Control Signal |
| 45 | I2C-OPEN | Chip Select |
| 46 | GND | GND |
| 47 | DVD-AUDIO-MUTE | DVD Audio Mute Signal |
| 48 | DVD-H | DVD On Signal at High |
| 49 | GND | GND |
| 50 | DVD-CS | DVD Interface Chip Select |
| 51 | DVD-SCLK | DVD Interface Serial Clock |
| 52 | DVD-SDATA | DVD Interface Serial Data |
| 53 | P-ON+5V | OSD VCC |
| 54 | HLF | Horizontal Filter |
| 55 | V-HOLD | Vertical Hold |
| 56 | CV-IN | Composite Video Signal Input |
| 57 | GND | GND |
| 58 | H-SYNC | Horizontal Sync Input |
| 59 | V-SYNC | Vertical Sync Input |
| 60 | OSD-BLK | Output for Picture Cut off |
| 61 | NU | Not Used |
| 62 | OSD-B | Blue Signal Output |
| 63 | OSD-G | Green Signal Output |
| 64 | OSD-R | Red Signal Output |
| 65 | DTV-S-SOUT | DTV Serial Data Output |
| 66 | DTV-S-SIN | DTV Serial Data Input |
| 67 | DTV-S-SCLK | DTV Serial Clock |
| 68 | YCA-SDA | YCA Serial Data |
| 69 | YCA-CS | YCA Chip Select |

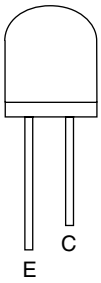
| Pin No. | Signal Name | Function |
|---|---|---|
| 70 | YCA-SCL | YCA Serial Clock |
| 71 | SCL | Serial Clock |
| 72 | SDA | Serial Data |
| 73 | C-F/R | Capstan Motor FWD/REV Control Signal |
| 74 | C-SYNC | Composite Sync Input |
| 75 | P-ON-H2 | Power On Signal at High |
| 76 | C-CONT | Capstan Motor Control Signal |
| 77 | D-CONT | Drum Motor Control Signal |
| 78 | P-SAFETY 3 | Power Supply Failure Detection 3 |
| 79 | NU | Not Used |
| 80 | T-REEL | Take Up Reel Rotation Signal |
| 81 | DTV-S-RESET | DTV Reset |
| 82 | LD-CONT | Loading Motor Control Signal |
| 83 | DIGITAL-AUDIO-H | Digital Audio Signal |
| 84 | P-DOWN | Power Voltage Down Detector Signal |
| 85 | DTV-S-SREQ | DTV Serial Request |
| 86 | NU | Not Used |
| 87 | C-FG | Capstan Motor Rotation Detection Pulse |
| 88 | GND | GND (AMP) |
| 89 | NU | Not Used |
| 90 | D-PFG | Drum Motor Pulse Generator |
| 91 | NU | Not Used |
| 92 | AMP-VREF-IN | Standard Voltage Input |
| 93 | C | Ext. Capacitor Connection Port for Analog Amp |
| 94 | CTL (-) | Record/Playback Control Signal (-) |
| 95 | CTL (+) | Record/Playback Control Signal (+) |
| 96 | AMPC | Amp Capacitor |
| 97 | CTL-AMP-OUT | Control Amp Output |
| 98 | P-ON+5V | Power Supply for AMP |
| 99 | AL+5V | A/D, D/A Standard Voltage |
| 100 | P-SAFETY 1 | Power Supply Failure Detection 1 |

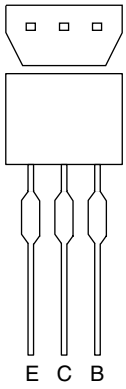
# LEAD IDENTIFICATIONS

2SK3563
2SK3757(Q)

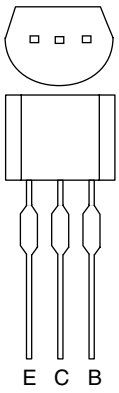



MID-32A22F



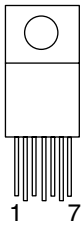




KRA103M-AT/P
KRC103M-AT/P
KTA1267-GR-AT/P
KTC3199-GR-AT/P
KTC3199-Y-AT/P

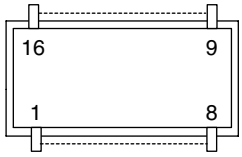



2SA950-O(TE2 F T)
2SC2120-O(TE2 F T)
2SC1627-Y(TE2.F.T)
2SC2482
2SC3331(T)
2SD400(F)

LA78040A




AN17812A

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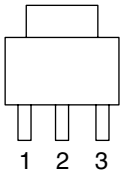
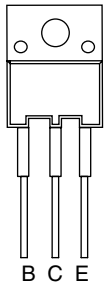
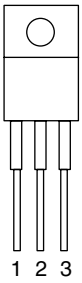



1: GND
2: Vout
3: Vin

2SC5885000RF

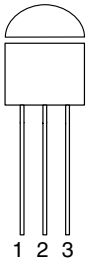



KIA7805API/P



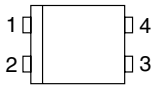

1: IN
2: GND
3: OUT

KIA431-AT/P



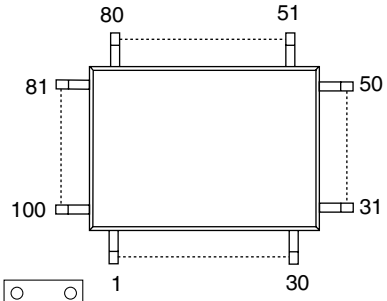

1: R
2: A
3: K

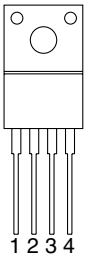
LTV-817C-F




1: A
2: K
3: E
4: C

M3776AMFH-BB2GP

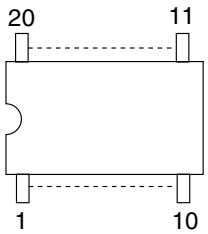


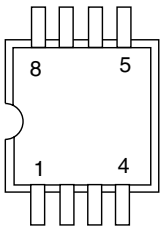

PQ070XF01SZH

1: Vin
2: Vo
3: GND
4: Vc

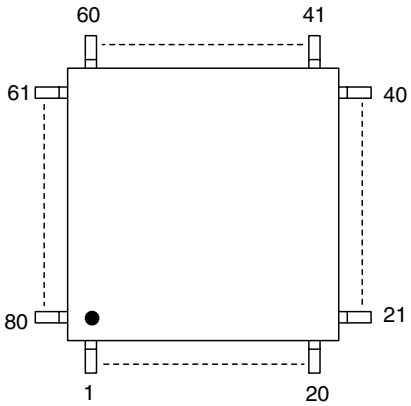
M61116FP TF0G



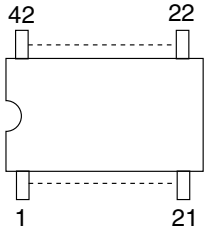

AT24C128N-10SU-1.8S
M24C04-WMN6TP



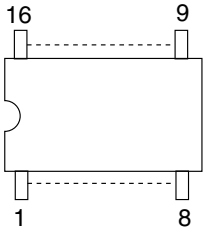

LA71205M-MPB-E
LA72670BM-MPB-E




M61276FP TF0H



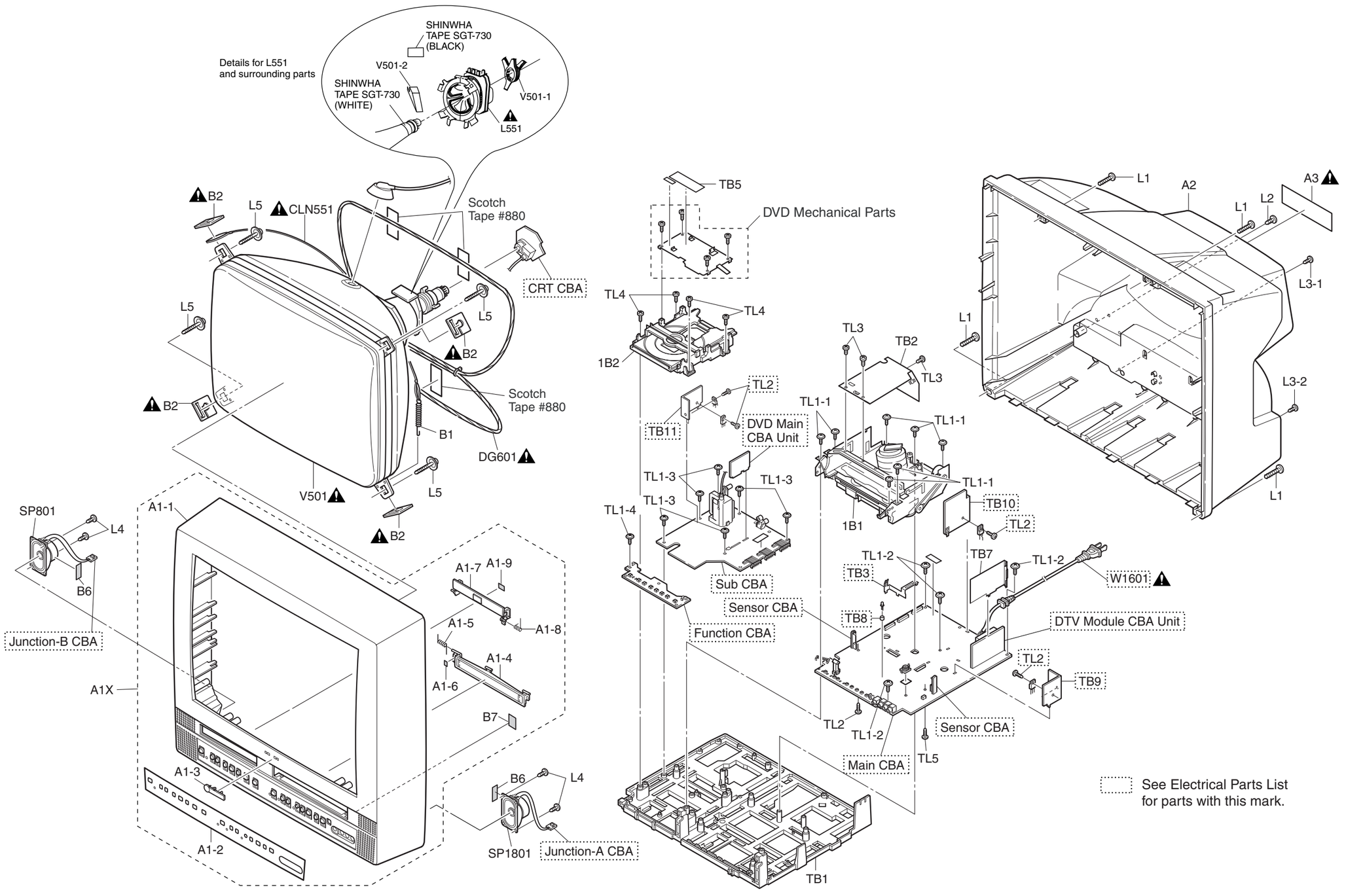

TC4053BF(EL N F)



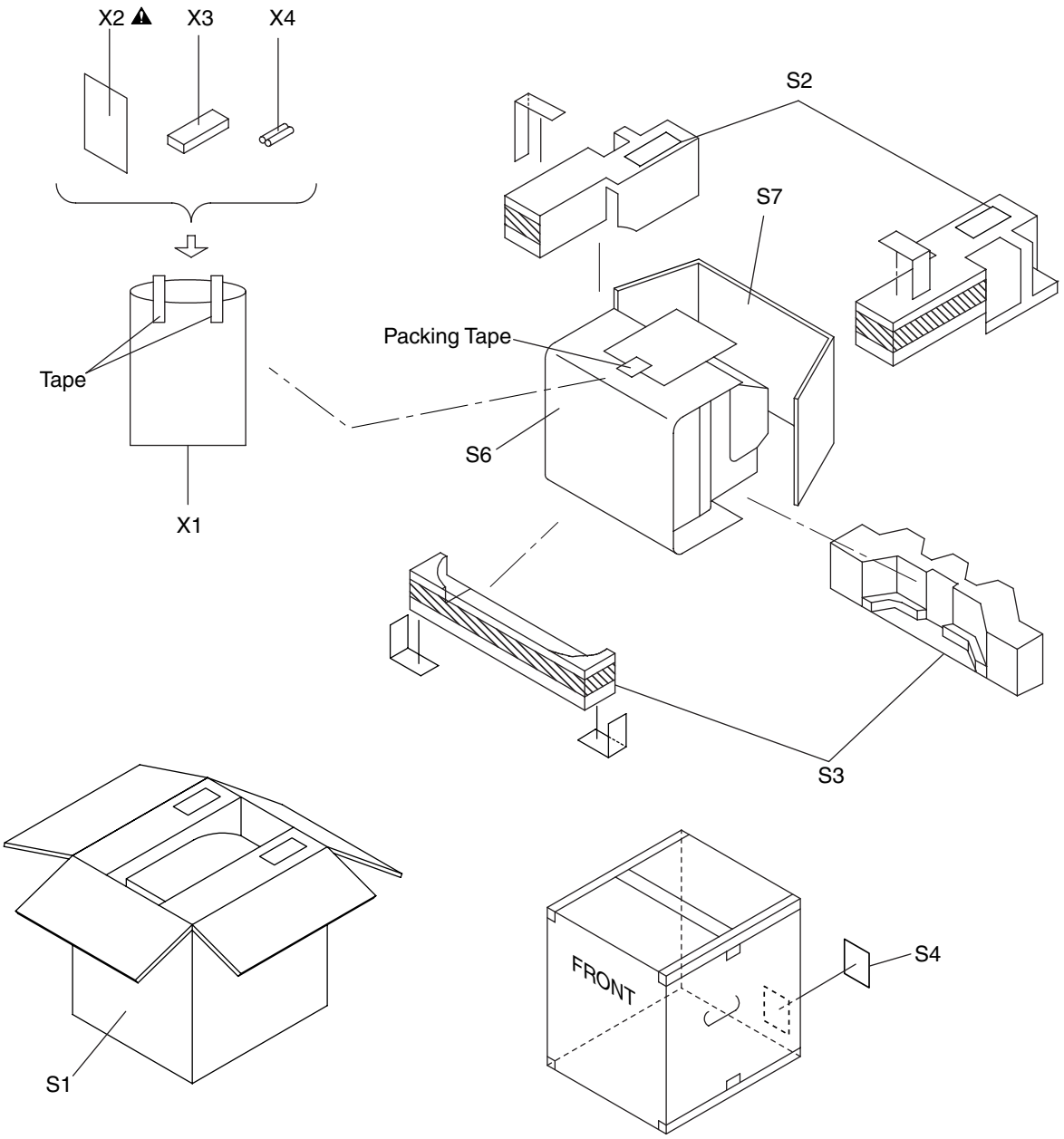

**Note:**
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
S: Source
G: Gate
D: Drain

# EXPLODED VIEWS

## Cabinet



# Packing



# MECHANICAL PARTS LIST

**PRODUCT SAFETY NOTE:** Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

**NOTE:** Parts that are not assigned part numbers (---------) are not available.

| Ref. No. | Description | Part No. |
|---|---|---|
| A1X | FRONT CABINET ASSEMBLY P7752UT | 1EM121853 |
| A1-1 | FFRONT CABINET P7752UT | 1EM121854 |
| A1-2 | CONTROL PLATE P7752UT | 1EM221547 |
| A1-3 | BADGE L BRAND T0204UE | 1EM422935 |
| A1-4 | CASSETTE DOOR P7752UT | 1EM424270 |
| A1-5 | SPRING DOOR T1200UA | 1EM422903 |
| A1-6 | CLOTH(4X7XT0.7) T5000UA | 0EM404974 |
| A1-7 | TRAY PANEL P7752UT | 1EM424269 |
| A1-8 | TRAY SPRING TD707UH | 0EM408552 |
| A1-9 | CLOTH(B) L5201U0 15X10X1.0T | 0EM400076 |
| A2 | REAR CABINET P7753UT | 1EM021559 |
| A3⚠ | RATING LABEL P7752UT | ---------- |
| 1B1 | DECK ASSEMBLY CZD014/VM2466 | N2466FT |
| 1B2 | DVD MECHA X7 TRIPLE N79U1KVM | N79U1KVM |
| B1 | SPRING TENSION B0080B0 EM40808 | 26WH006 |
| B2⚠ | DEGAUSS HOLDER L2401UB | 1EM420205 |
| B6 | CLOTH(10X30XT0.5) B5900UA | 0EM404486 |
| B7 | CLOTH(15X10XT0.5) L9700UA | 0EM405038 |
| CLN551⚠ | CRT GND WIRE | WX1L7820-003 |
| DG601⚠ | DEGAUSSING COIL (AL) ZTM054A | LLBH00ZTM069 |
| L1 | SCREW P-TIGHT 4X18 BIND HEAD + | GBJP4180 |
| L2 | SCREW TAPPING M4X14 | DBT14140 |
| L3-1 | SCREW P-TIGHT 3X10 BIND HEAD+ | GBHP3100 |
| L3-2 | SCREW P-TIGHT 3X10 BIND HEAD+ | GBHP3100 |
| L4 | SCREW P-TIGHT 3X10 BIND HEAD+ | GBJP3100 |
| L5 | SCREW L1500UA | 0EM406142A |
| L551⚠ | DEFLECTION YOKE (PB FREE) CDY-MM2102A1 | LLBY00Z0X011 |
| SP801 | SPEAKER S0407F01A | DSD0807XQ001 |
| SP1801 | SPEAKER S0407F01A | DSD0807XQ001 |
| TB1 | TRAY CHASSIS T3220UA | 1EM021069 |
| TB2 | TOP SHIELD T1100UA | 1EM320155 |
| TB5 | LASER CAUTION LABEL T8200UA | ---------- |
| TB7 | MODULE PCB HOLDER P7150UT | 1EM322373A |
| TL1-1 | SCREW P-TIGHT 3X12 WASHER HEAD+ | GCJP3120 |
| TL1-2 | SCREW P-TIGHT 3X12 WASHER HEAD+ | GCJP3120 |
| TL1-3 | SCREW P-TIGHT 3X12 WASHER HEAD+ | GCJP3120 |
| TL1-4 | SCREW P-TIGHT 3X12 WASHER HEAD+ | GCJP3120 |
| TL2 | SCREW B-TIGHT D3X8 BIND HEAD+ | GBJB3080 |
| TL3 | SCREW S-TIGHT M3X4 BIND HEAD | GBJS3040 |
| TL4 | SCREW P-TIGHT 3X20 BIND HEAD + | GBJP3200 |
| TL5 | SCREW P-TIGHT M3X8 BIND HEAD+ BLK | GBHP3080 |
| V501⚠ | CRT A51LYX996X | TCRT190MS015 |
| V501-1 | C.P.MAGNET JH225-19C | XM04000BV016 |
| V501-2 | WEDGE FT-00110W | XV10000T4001 |
| **PACKING** | | |
| S1 | CARTON P7752UT | 1EM424271 |
| S2 | STYROFORM TOP ASSEMBLY P7753UT | 1ESA14095 |
| S3 | STYROFORM BOTTOM ASSEMBLY P7753UT | 1ESA14096 |
| S4 | SERIAL NO. LABEL L9750UA | ---------- |
| S6 | SET SHEET B7500UA 1000X1700 | 0EM402178 |
| S7 | HOLD PAD T1100UA | 1EM420618 |
| **ACCESSORIES** | | |
| X1 | BAG POLYETHYLENE 235X365XT0.03 | 0EM408420A |
| X2⚠ | OWNERS MANUAL P7752UT | 1EMN22135 |
| X3 | REMOTE CONTROL NF016UD 151/ECNX801/ NF016UD | NF016UD |
| X4 | DRY BATTERY(SUNRISE) R6SSE/2S | XB0M451MS002 |

# ELECTRICAL PARTS LIST

**PRODUCT SAFETY NOTE:** Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

**NOTES:**

1. Parts that are not assigned part numbers (---------) are not available.
2. Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25% D.....±0.5% F.....±1%

G.....±2% J.....±5% K.....±10%

M.....±20% N.....±30% Z.....+80/-20%

## DTV MODULE CBA UNIT

| Ref. No. | Description | Part No. |
|---|---|---|
| | DTV MODULE CBA UNIT | 1ESA14071 |

## DVD MAIN CBA UNIT

| Ref. No. | Description | Part No. |
|---|---|---|
| | DVD MAIN CBA UNIT | N7CT5KUP |

## MMA CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | MMA CBA<br>Consists of the following: | 1ESA14233 |
| | MAIN CBA<br>SENSOR CBA | ----------<br>1ESA12193 |

## MAIN CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | MAIN CBA<br>Consists of the following: | ---------- |
| | **CAPACITORS** | |
| C1006 | ELECTROLYTIC CAP. 1μF/50V M | CE1JMASDL1R0 |
| C1008 | CERAMIC CAP.(AX) B K 1000pF/50V | CCA1JKT0B102 |
| C1010 | ELECTROLYTIC CAP. 100μF/6.3V M | CE0KMASDL101 |
| C1030 | ELECTROLYTIC CAP. 100μF/6.3V M | CE0KMASDL101 |
| C1034 | CHIP CERAMIC CAP.(1608) B K 1000pF/50V | CHD1JK30B102 |
| C1035 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1037 | CHIP CERAMIC CAP. F Z 0.01μF/50V | CHD1JZ30F103 |
| C1040 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/25V | CHD1EZ30F104 |
| C1041 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1043 | FILM CAP.(P) 0.018μF/50V J | CMA1JJS00183 |
| C1044 | CHIP CERAMIC CAP.(1608) B K 0.047μF/50V | CHD1JK30B473 |
| C1045 | CHIP CERAMIC CAP. CH D 3pF/50V | CHD1JD3CH3R0 |
| C1046 | ELECTROLYTIC CAP. 1μF/50V M | CE1JMASDL1R0 |
| C1049 | CERAMIC CAP.(AX) CH K 2.7pF/50V | CCA1JKTCH2R7 |
| C1050 | CHIP CERAMIC CAP. CH D 6pF/50V | CHD1JD3CH6R0 |
| C1121 | CHIP CERAMIC CAP.(1608) CH J 47pF/50V | CHD1JJ3CH470 |
| C1122 | CHIP CERAMIC CAP.(1608) CH J 47pF/50V | CHD1JJ3CH470 |
| C1123 | ELECTROLYTIC CAP. 100μF/6.3V M | CE0KMASDL101 |
| C1124 | ELECTROLYTIC CAP. 47μF/16V M | CE1CMASDL470 |
| C1127 | ELECTROLYTIC CAP. 1000μF/6.3V M | CE0KMASDL102 |
| C1128 | ELECTROLYTIC CAP. 100μF/6.3V M | CE0KMASDL101 |
| C1129 | ELECTROLYTIC CAP. 100μF/6.3V M | CE0KMASDL101 |
| C1131 | CHIP CERAMIC CAP. F Z 0.01μF/50V | CHD1JZ30F103 |
| C1203 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/50V | CHD1JZ30F104 |
| C1206 | CHIP CERAMIC CAP. F Z 0.047μF/50V | CHD1JZ30F473 |
| C1207 | ELECTROLYTIC CAP. 47μF/6.3V M H7 | CE0KMAVSL470 |
| C1208 | ELECTROLYTIC CAP. 47μF/6.3V M H7 | CE0KMAVSL470 |
| C1210 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1212 | CHIP CERAMIC CAP.(1608) CH J 22pF/50V | CHD1JJ3CH220 |
| C1213 | CHIP CERAMIC CAP.(1608) CH J 22pF/50V | CHD1JJ3CH220 |
| C1214 | ELECTROLYTIC CAP. 47μF/6.3V M H7 | CE0KMAVSL470 |
| C1217 | CHIP CERAMIC CAP.(1608) CH D 10pF/50V | CHD1JD3CH100 |
| C1218 | CHIP CERAMIC CAP. CH J 15pF/50V | CHD1JJ3CH150 |
| C1220 | ELECTROLYTIC CAP. 47μF/6.3V M H7 | CE0KMAVSL470 |
| C1222 | CHIP CERAMIC CAP. B K 2200pF/50V | CHD1JK30B222 |
| C1223 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1224 | CHIP CERAMIC CAP.(1608) B K 1000pF/50V | CHD1JK30B102 |
| C1225 | CHIP CERAMIC CAP. CH J 560pF/50V | CHD1JJ3CH561 |
| C1234 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/25V | CHD1EZ30F104 |
| C1235 | CHIP CERAMIC CAP.(1608) B K 0.022μF/50V | CHD1JK30B223 |
| C1239 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1240 | CHIP CERAMIC CAP. CH J 560pF/50V | CHD1JJ3CH561 |
| C1241 | CHIP CERAMIC CAP.(1608) B K 4700pF/50V | CHD1JK30B472 |
| C1243 | ELECTROLYTIC CAP. 22μF/16V M LL | CE1CMASLH220 |
| C1245 | ELECTROLYTIC CAP. 47μF/6.3V M | CE0KMASDL470 |
| C1247 | ELECTROLYTIC CAP. 47μF/6.3V M H7 | CE0KMAVSL470 |
| C1251 | CHIP CERAMIC CAP.(1608) B K 2700pF/50V | CHD1JK30B272 |
| C1252 | ELECTROLYTIC CAP. 100μF/16V M | CE1CMASDL101 |
| C1253 | ELECTROLYTIC CAP. 100μF/6.3V M | CE0KMASDL101 |
| C1254 | ELECTROLYTIC CAP. 47μF/25V M | CE1EMASDL470 |
| C1264 | CHIP CERAMIC CAP. F Z 0.047μF/50V | CHD1JZ30F473 |
| C1299 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1410 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1411 | ELECTROLYTIC CAP. 100μF/10V M H7 | CE1AMAVSL101 |
| C1413 | CHIP CERAMIC CAP.(1608) CH J 390pF/50V | CHD1JJ3CH391 |
| C1414 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| C1416 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1417 | CHIP CERAMIC CAP. B K 220pF/50V | CHD1JK30B221 |
| C1418 | CHIP CERAMIC CAP.(1608) B K 0.1μF/50V | CHD1JK30B104 |
| C1419 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1420 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1421 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1422 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1423 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1424 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1425 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1426 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1427 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1428 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1429 | ELECTROLYTIC CAP. 47μF/6.3V M H7 | CE0KMAVSL470 |
| C1430 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1431 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1432 | ELECTROLYTIC CAP. 1μF/50V M H7 | CE1JMAVSL1R0 |
| C1435 | ELECTROLYTIC CAP. 1μF/50V M H7 | CE1JMAVSL1R0 |
| C1436 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1437 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1438 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1439 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |

| Ref. No. | Description | Part No. |
|---|---|---|
| C1441 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/50V | CHD1JZ30F104 |
| C1442 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/25V | CHD1EZ30F104 |
| C1443 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/25V | CHD1EZ30F104 |
| C1444 | ELECTROLYTIC CAP. 100μF/6.3V H7 | CE0KMAVSL101 |
| C1452 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1463 | CHIP CERAMIC CAP. CH J 820pF/25V | CHD1EJ3CH821 |
| C1464 | CHIP CERAMIC CAP.(1608) B K 2700pF/50V | CHD1JK30B272 |
| C1465 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1466 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1468 | ELECTROLYTIC CAP. 33μF/16V M H7 | CE1CMAVSL330 |
| C1469 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1602 | ELECTROLYTIC CAP. 1000μF/6.3V M | CE0KMASDL102 |
| C1604⚠ | METALIZED FILM CAP. 0.1μF/250V | CT2E104MS037 |
| C1605⚠ | METALIZED FILM CAP. 0.22μF/250V | CT2E224MS037 |
| C1610 | ELECTROLYTIC CAP. 470μF/200V LX | CA2D471S6017 |
| C1611 | CERAMIC CAP. 680pF/2KV | CA3D681PAN04 |
| C1612 | FILM CAP.(P) 0.033μF/50V J | CMA1JJS00333 |
| C1613 | FILM CAP.(P) 0.0015μF/50V J | CMA1JJS00152 |
| C1614⚠ | FILM CAP.(P) 0.082μF/50V J | CMA1JJS00823 |
| C1615 | CERAMIC CAP. 560pF/2KV | CA3D561PAN04 |
| C1616 | ELECTROLYTIC CAP. 100μF/160V M | CE2CMZPDL101 |
| C1617⚠ | ELECTROLYTIC CAP. 470μF/35V M | CE1GMASDL471 |
| C1618 | ELECTROLYTIC CAP. 1000μF/10V M | CE1AMASDL102 |
| C1619 | ELECTROLYTIC CAP. 1000μF/16V M | CE1CMZPDL102 |
| C1621 | ELECTROLYTIC CAP. 47μF/16V M | CE1CMASDL470 |
| C1630⚠ | SAFETY CAP. 4700pF/250V KX | CA2E472MR050 |
| C1651 | ELECTROLYTIC CAP. 1000μF/6.3V M | CE0KMASDL102 |
| C1652 | FILM CAP.(P) 0.0047μF/50V J | CMA1JJS00472 |
| C1653 | ELECTROLYTIC CAP. 1000μF/6.3V M | CE0KMASDL102 |
| C1671 | CERAMIC CAP. B K 2200pF/500V | CCD2JKS0B222 |
| C1688 | ELECTROLYTIC CAP. 10μF/16V M H7 | CE1CMAVSL100 |
| C1689 | ELECTROLYTIC CAP. 47μF/25V M | CE1EMASDL470 |
| C1740 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/50V | CHD1JZ30F104 |
| C1747 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1748 | CHIP CERAMIC CAP.(1608) B K 0.047μF/50V | CHD1JK30B473 |
| C1752 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1753 | ELECTROLYTIC CAP. 10μF/25V M H7 | CE1EMAVSL100 |
| C1754 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1755 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1756 | ELECTROLYTIC CAP. 10μF/25V M H7 | CE1EMAVSL100 |
| C1757 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1758 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1759 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1760 | CHIP CERAMIC CAP.(1608) B K 4700pF/50V | CHD1JK30B472 |
| C1762 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1763 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1764 | ELECTROLYTIC CAP. 100μF/6.3V H7 | CE0KMAVSL101 |
| C1766 | ELECTROLYTIC CAP. 2.2μF/50V M H7 | CE1JMAVSL2R2 |
| C1769 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1770 | CHIP CERAMIC CAP.(1608) B K 4700pF/50V | CHD1JK30B472 |
| C1771 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1772 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1773 | ELECTROLYTIC CAP. 10μF/25V M H7 | CE1EMAVSL100 |
| C1774 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1775 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1776 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1777 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1778 | CHIP CERAMIC CAP.(1608) B K 0.01μF/50V | CHD1JK30B103 |
| C1779 | ELECTROLYTIC CAP. 2.2μF/50V M H7 | CE1JMAVSL2R2 |
| C1780 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1781 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1782 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1783 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1784 | CHIP CERAMIC CAP.(1608) F Z 0.1μF/50V | CHD1JZ30F104 |
| C1786 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1787 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1788 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1789 | ELECTROLYTIC CAP. 22μF/16V M H7 | CE1CMAVSL220 |
| C1790 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1791 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1792 | ELECTROLYTIC CAP. 4.7μF/50V M H7 | CE1JMAVSL4R7 |
| C1793 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1794 | ELECTROLYTIC CAP. 10μF/50V M H7 | CE1JMAVSL100 |
| C1795 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1797 | ELECTROLYTIC CAP. 100μF/10V M H7 | CE1AMAVSL101 |
| C1801 | ELECTROLYTIC CAP. 220μF/16V M | CE1CMASDL221 |
| C1803 | CHIP CERAMIC CAP.(1608) B K 4700pF/50V | CHD1JK30B472 |
| C1804 | CHIP CERAMIC CAP.(1608) B K 4700pF/50V | CHD1JK30B472 |
| C1807 | ELECTROLYTIC CAP. 220μF/16V M | CE1CMASDL221 |
| C1811 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1813 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1814 | ELECTROLYTIC CAP. 2.2μF/50V M H7 | CE1JMAVSL2R2 |
| C1815 | ELECTROLYTIC CAP. 47μF/16V M H7 | CE1CMAVSL470 |
| C1818 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1819 | CHIP CERAMIC CAP. F Z 1μF/10V | CHD1AZ30F105 |
| C1821 | ELECTROLYTIC CAP. 470μF/16V M | CE1CMASDL471 |
| C1850 | ELECTROLYTIC CAP. 10μF/50V M H7 | CE1JMAVSL100 |
| C1851 | ELECTROLYTIC CAP. 10μF/50V M H7 | CE1JMAVSL100 |
| C1852 | ELECTROLYTIC CAP. 10μF/50V M H7 | CE1JMAVSL100 |
| C1853 | ELECTROLYTIC CAP. 10μF/50V M H7 | CE1JMAVSL100 |
| C1855 | ELECTROLYTIC CAP. 10μF/50V M H7 | CE1JMAVSL100 |
| C1856 | ELECTROLYTIC CAP. 10μF/50V M H7 | CE1JMAVSL100 |
| C1870 | ELECTROLYTIC CAP. 47μF/6.3V M H7 | CE0KMAVSL470 |
| C1871 | ELECTROLYTIC CAP. 100μF/16V M H7 | CE1CMAVSL101 |
| C1872 | CERAMIC CAP. B K 470pF/100V | CCD2AKS0B471 |
| C1873 | FILM CAP.(P) 0.018μF/100V J | CMA2AJS00183 |
| C1901 | ELECTROLYTIC CAP. 0.47μF/50V M | CE1JMASDLR47 |
| C1903 | ELECTROLYTIC CAP. 1000μF/10V M | CE1AMASDL102 |
| C1904 | ELECTROLYTIC CAP. 47μF/16V M | CE1CMASDL470 |
| C1905 | ELECTROLYTIC CAP. 2.2μF/250V M | CA2E2R2S6009 |
| C1906 | CERAMIC CAP. B K 330pF/500V | CCD2JKS0B331 |
| C1907 | FILM CAP.(P) 0.0015μF/50V J | CMA1JJS00152 |
| C1908 | FILM CAP.(P) 0.018μF/50V J | CMA1JJS00183 |
| C1909 | CERAMIC CAP.(AX) X M 4700pF/16V | CCA1CMT0X472 |
| C1910 | ELECTROLYTIC CAP. 1000μF/16V M | CE1CMZPDL102 |
| C1912 | ELECTROLYTIC CAP. 47μF/16V M | CE1CMASDL470 |
| | **CONNECTORS** | |
| CN601A | TERMINAL PRINTBORD PIN MS-PIN155155 | JTEA001CHY01 |
| CN601B | TERMINAL PRINTBORD PIN MS-PIN155155 | JTEA001CHY01 |
| CN1103 | BOARD CONNECTOR 19P(PB FREE) 127301119K2 | JCTWA19TG004 |
| CN1104 | TWG CONNECTOR 07P TWG-P07P-A1 | J3TWA07TG001 |
| CN1301 | BOARD CONNECTOR 19P(PB FREE) 127301119K2 | JCTWA19TG004 |
| CN1302 | BOARD CONNECTOR 19P(PB FREE) 127301119K2 | JCTWA19TG004 |
| CN1802 | 242 SERIES CONNECTOR 224202104W1 | J322C04TG001 |
| | **DIODES** | |
| D1105 | ZENER DIODE MTZJT-775.6C | QDTC0MTZJ5R6 |
| D1108 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1109 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1110 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1111 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1112 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1113 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1204 | LED LTL-4214M1 | NPQZLTL4214M |

| Ref. No. | Description | Part No. |
|---|---|---|
| D1216 | LED LAMP 333GT/F45-50 | NPWZ3GTF4550 |
| D1217 | LED LAMP 333GT/F45-50 | NPWZ3GTF4550 |
| D1224 | LED SIR-563ST3F P | QPQPS1R563ST |
| D1229⚠ | ZENER DIODE MTZJT-7715B | QDTB00MTZJ15 |
| D1230⚠ | ZENER DIODE MTZJT-7715B | QDTB00MTZJ15 |
| D1231 | ZENER DIODE MTZJT-7718A | QDTA00MTZJ18 |
| D1238 | ZENER DIODE MTZJT-775.6B | QDTB0MTZJ5R6 |
| D1419 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1420 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1603⚠ | DIODE 1N5406 | NDLZ001N5406 |
| D1604⚠ | DIODE 1N5406 | NDLZ001N5406 |
| D1605⚠ | DIODE 1N5406 | NDLZ001N5406 |
| D1606⚠ | DIODE 1N5406 | NDLZ001N5406 |
| D1607⚠ | ZENER DIODE MTZJT-7724C | QDTC00MTZJ24 |
| D1609 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1610 | ZENER DIODE MTZJT-775.6B | QDTB0MTZJ5R6 |
| D1611 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1613⚠ | RECOVERY DIODE ERC18-04 | QDZZ0ERC1804 |
| D1614⚠ | DIODE FR104-B | NDLZ000FR104 |
| D1615⚠ | RECTIFIER DIODE 1N4005 | NDQZ001N4005 |
| D1616⚠ | FAST RECOVERY DIODE FR202 | NDWZ000FR202 |
| D1617⚠ | SCHOTTKY BARRIER DIODE SB270-B/P | NDWZ000SB270 |
| D1620⚠ | ZENER DIODE MTZJT-776.8B | QDTB0MTZJ6R8 |
| D1621 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1622⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1623⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1624⚠ | SCHOTTKY BARRIER DIODE SB240-B/P | NDQZ000SB240 |
| D1626 | ZENER DIODE MTZJT-7733B | QDTB00MTZJ33 |
| D1627⚠ | ZENER DIODE MTZJT-7716B | QDTB00MTZJ16 |
| D1628⚠ | SCHOTTKY BARRIER DIODE SB240-B/P | NDQZ000SB240 |
| D1634 | ZENER DIODE MTZJT-779.1B | QDTB0MTZJ9R1 |
| D1635 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1636⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1637 | DIODE FR104-B | NDLZ000FR104 |
| D1640⚠ | DIODE 1ZC36(Q) | QDLZ001ZC36Q |
| D1641⚠ | ZENER DIODE MTZJT-7739B | QDTB00MTZJ39 |
| D1645⚠ | SCHOTTKY BARRIER DIODE SB140 | NDWZ000SB140 |
| D1682 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1683 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1685⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1687⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1692 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| D1811⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1901⚠ | DIODE FR104-B | NDLZ000FR104 |
| D1902⚠ | DIODE FR154 | NDLZ000FR154 |
| D1903⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1904⚠ | SCHOTTKY BARRIER DIODE SB140 | NDWZ000SB140 |
| D1905 | ZENER DIODE MTZJT-776.2C | QDTC0MTZJ6R2 |
| D1906⚠ | ZENER DIODE MTZJT-7739B | QDTB00MTZJ39 |
| D1907⚠ | ZENER DIODE MTZJT-776.8B | QDTB0MTZJ6R8 |
| D1908 | RECTIFIER DIODE BA158 | NDQZ000BA158 |
| D1909 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D1910⚠ | ZENER DIODE MTZJT-7715B | QDTB00MTZJ15 |
| **ICS** | | |
| IC1001 | IC VIF/SIF M61116FP TF0G | QSZBA0SHT034 |
| IC1101 | VOLTAGE REGULATOR PQ070XF01SZH | QSZBA0SSH054 |
| IC1104 | IC EEPROM AT24C128N-10SU-1.8 S | NSZBA0TAZ083 |
| IC1105 | IC SHUNT REGULATOR KIA431-AT/P | NSZBA0TJY036 |
| IC1106 | IC SHUNT REGULATOR KIA431-AT/P | NSZBA0TJY036 |
| IC1201⚠ | IC MICRO COMPUTER M3776AMFH-BB2GP | QSZAA0RHT161 |
| IC1202 | IC(EEP-ROM) M24C04-WMN6TP | NSZAA0TSS015 |
| IC1401 | IC Y/C/A LA71205M-MPB-E | QSZBA0RSY037 |

| Ref. No. | Description | Part No. |
|---|---|---|
| IC1601⚠ | PHOTOCOUPLER LTV-817C-F | NPEC0LTV817F |
| IC1682⚠ | IC VOLTAGE REGULATOR 5V KIA7805API/P | NSZBA0SJY041 |
| IC1701 | IC HIFI LA72670BM-MPB-E | QSZBA0RSY039 |
| IC1803 | IC AN17812A | QSZBA0SMS017 |
| IC1850 | IC SWITCH TC4053BF(EL N F) | QSZBA0TTS163 |
| IC1901⚠ | PHOTOCOUPLER LTV-817C-F | NPEC0LTV817F |
| IC1902⚠ | PHOTOCOUPLER LTV-817C-F | NPEC0LTV817F |
| **COILS** | | |
| L1001 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| L1002 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| L1005 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| L1006 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| L1031 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| L1032 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| L1033 | INDUCTOR 150μH-J-26T | LLAXJATTU151 |
| L1112 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| L1202 | INDUCTOR 0.10μH-K-26T | LLAXKATTUR10 |
| L1601⚠ | LINE FILTER JLB20102 | LLEG0Z0XB006 |
| L1872 | INDUCTOR 47μH-K-5FT | LLARKBSTU470 |
| **TRANSISTORS** | | |
| Q1103 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1104 | TRANSISTOR 2SA950-O (TE2 F T) | QQS002SA950F |
| Q1105 | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1106 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1107 | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1108 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1109 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1110 | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1112 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1113 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1205 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1206 | PHOTO TRANSISTOR MID-32A22F | NPWZ1D32A22F |
| Q1207 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1208 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1209 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1210 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1221 | RES. BUILT-IN TRANSISTOR KRA103M-AT/P | NQSZ0KRA103M |
| Q1401 | TRANSISTOR KTA1267-GR-AT/P | NQS1KTA1267P |
| Q1402 | TRANSISTOR KTA1267-GR-AT/P | NQS1KTA1267P |
| Q1403 | TRANSISTOR KTA1267-GR-AT/P | NQS1KTA1267P |
| Q1404 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1601⚠ | MOS FET 2SK3563 | QFWZ02SK3563 |
| Q1602⚠ | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1604⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1605 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1607⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1613⚠ | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1614⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1681⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1688⚠ | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1689⚠ | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1701 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1850 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1871 | TRANSISTOR KTA1267-GR-AT/P | NQS1KTA1267P |
| Q1872 | TRANSISTOR 2SC2120-O(TE2 F T) | QQS02SC2120F |
| Q1873 | TRANSISTOR 2SC3331(T) | QSC3331TNPAA |
| Q1874 | TRANSISTOR 2SC3331(T) | QSC3331TNPAA |
| Q1875 | RES. BUILT-IN TRANSISTOR KRA103M-AT/P | NQSZ0KRA103M |
| Q1901 | TRANSISTOR KTA1267-GR-AT/P | NQS1KTA1267P |
| Q1902⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1903⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1904⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |

| Ref. No. | Description | Part No. |
|---|---|---|
| Q1905⚠ | FET 2SK3757(Q) | QFWZ02SK3757 |
| Q1906 | NPN TRANSISTOR KRC103M-AT/P | NQSZKRC103MP |
| Q1907⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q1908⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| | **RESISTORS** | |
| R1001 | CHIP RES. 1/10W J 220 Ω | RRXAJR5Z0221 |
| R1002 | CHIP RES. 1/10W J 220 Ω | RRXAJR5Z0221 |
| R1004 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1005 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1031 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1032 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R1033 | CHIP RES. 1/10W J 390k Ω | RRXAJR5Z0394 |
| R1034 | CHIP RES. 1/10W J 1.8k Ω | RRXAJR5Z0182 |
| R1037 | CHIP RES. 1/10W J 180 Ω | RRXAJR5Z0181 |
| R1038 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1039 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1040 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1041 | CARBON RES. 1/4W J 15k Ω | RCX4JATZ0153 |
| R1042 | CHIP RES. 1/10W J 15k Ω | RRXAJR5Z0153 |
| R1043 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1049 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1050 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1109 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1120 | CHIP RES. 1/10W J 330 Ω | RRXAJR5Z0331 |
| R1121 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1122 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1123 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1124 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1126 | CHIP RES. 1/10W J 820 Ω | RRXAJR5Z0821 |
| R1127 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1128 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1129 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1130 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1131 | METAL OXIDE FILM RES. 1W J 8.2 Ω | RN018R2ZU001 |
| R1140 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1141 | CHIP RES. 1/10W J 56k Ω | RRXAJR5Z0563 |
| R1143 | CARBON RES. 1/4W J 220 Ω | RCX4JATZ0221 |
| R1145 | CARBON RES. 1/4W J 12 Ω | RCX4JATZ0120 |
| R1146 | CARBON RES. 1/4W J 2.7 Ω | RCX4JATZ02R7 |
| R1147 | CARBON RES. 1/4W J 12 Ω | RCX4JATZ0120 |
| R1148 | CARBON RES. 1/4W J 2.2 Ω | RCX4JATZ02R2 |
| R1149 | CARBON RES. 1/4W J 560 Ω | RCX4JATZ0561 |
| R1150 | CARBON RES. 1/4W J 2.2 Ω | RCX4JATZ02R2 |
| R1151 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1152 | CHIP RES. 1/10W F 22k Ω | RRXAFR5H2202 |
| R1153 | CHIP RES. 1/10W F 220 Ω | RRXAFR5H2200 |
| R1154 | CARBON RES. 1/4W J 820 Ω | RCX4JATZ0821 |
| R1155 | CHIP RES. 1/10W J 5.6k Ω | RRXAJR5Z0562 |
| R1156 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1157 | CHIP RES. 1/10W J 3.3k Ω | RRXAJR5Z0332 |
| R1158 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1159 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1160 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1161 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1162 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1164 | METAL OXIDE FILM RES. 1W J 0.39 Ω | RN01R39ZU001 |
| R1165 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1166 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1167 | CHIP RES. 1/10W J 5.6k Ω | RRXAJR5Z0562 |
| R1168 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1170 | CHIP RES. 1/10W J 680 Ω | RRXAJR5Z0681 |
| R1171 | CHIP RES. 1/10W F 10k Ω | RRXAFR5H1002 |

| Ref. No. | Description | Part No. |
|---|---|---|
| R1172 | CHIP RES. 1/10W F 150 Ω | RRXAFR5H1500 |
| R1173 | CHIP RES. 1/10W F 4.7k Ω | RRXAFR5H4701 |
| R1174 | CARBON RES. 1/4W J 390 Ω | RCX4JATZ0391 |
| R1175 | CHIP RES. 1/10W J 15k Ω | RRXAJR5Z0153 |
| R1176 | CHIP RES. 1/10W J 39k Ω | RRXAJR5Z0393 |
| R1177 | CHIP RES. 1/10W J 39k Ω | RRXAJR5Z0393 |
| R1178 | CHIP RES. 1/10W J 15k Ω | RRXAJR5Z0153 |
| R1179 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1180 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1200 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1201 | CHIP RES. 1/10W F 4.7k Ω | RRXAFR5H4701 |
| R1202 | CHIP RES. 1/10W F 22k Ω | RRXAFR5H2202 |
| R1203 | CHIP RES. 1/10W F 470 Ω | RRXAFR5H4700 |
| R1204 | CHIP RES. 1/10W F 1.5k Ω | RRXAFR5H1501 |
| R1205 | CHIP RES. 1/10W F 3.6k Ω | RRXAFR5H3601 |
| R1206 | CHIP RES. 1/10W F 10k Ω | RRXAFR5H1002 |
| R1208⚠ | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1209 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1210 | CHIP RES. 1/10W F 15k Ω | RRXAFR5H1502 |
| R1211 | CHIP RES. 1/10W F 6.8k Ω | RRXAFR5H6801 |
| R1212 | CHIP RES. 1/10W F 4.7k Ω | RRXAFR5H4701 |
| R1213 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1214 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1215 | CHIP RES. 1/10W F 1.5k Ω | RRXAFR5H1501 |
| R1216 | CHIP RES. 1/10W F 1.5k Ω | RRXAFR5H1501 |
| R1217 | CHIP RES. 1/10W F 2.2k Ω | RRXAFR5H2201 |
| R1218 | CHIP RES. 1/10W F 2.7k Ω | RRXAFR5H2701 |
| R1219 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1220 | CHIP RES. 1/10W J 390k Ω | RRXAJR5Z0394 |
| R1221 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R1222 | CHIP RES. 1/10W J 390k Ω | RRXAJR5Z0394 |
| R1224 | CHIP RES. 1/10W J 680 Ω | RRXAJR5Z0681 |
| R1225 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R1226 | CHIP RES. 1/10W J 27k Ω | RRXAJR5Z0273 |
| R1227 | CHIP RES. 1/10W J 270 Ω | RRXAJR5Z0271 |
| R1228 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1229 | CHIP RES. 1/10W J 680 Ω | RRXAJR5Z0681 |
| R1230 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1231 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1232 | CHIP RES. 1/10W J 6.8k Ω | RRXAJR5Z0682 |
| R1233 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1234 | CHIP RES. 1/10W J 1.2k Ω | RRXAJR5Z0122 |
| R1235 | CHIP RES. 1/10W J 47 Ω | RRXAJR5Z0470 |
| R1236 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1237 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1238 | CHIP RES. 1/10W J 470k Ω | RRXAJR5Z0474 |
| R1239 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1240 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1241 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1242 | CHIP RES. 1/10W J 33k Ω | RRXAJR5Z0333 |
| R1243 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1244 | CHIP RES. 1/10W J 1M Ω | RRXAJR5Z0105 |
| R1245 | CHIP RES. 1/10W J 470 Ω | RRXAJR5Z0471 |
| R1246 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1247 | CHIP RES. 1/10W J 820 Ω | RRXAJR5Z0821 |
| R1248 | CHIP RES. 1/10W J 470 Ω | RRXAJR5Z0471 |
| R1249 | CHIP RES. 1/10W J 3.3k Ω | RRXAJR5Z0332 |
| R1250 | CHIP RES. 1/10W J 1.5k Ω | RRXAJR5Z0152 |
| R1251 | CHIP RES. 1/10W J 3.3k Ω | RRXAJR5Z0332 |
| R1252 | CHIP RES. 1/10W J 1.5k Ω | RRXAJR5Z0152 |
| R1253 | CHIP RES. 1/10W J 3.3k Ω | RRXAJR5Z0332 |
| R1254 | CHIP RES. 1/10W J 1.5k Ω | RRXAJR5Z0152 |
| R1255 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |

| Ref. No. | Description | Part No. |
|---|---|---|
| R1257 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1258 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1259 | CARBON RES. 1/4W J 1.2k Ω | RCX4JATZ0122 |
| R1260 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1261⚠ | METAL OXIDE FILM RES. 2W J 2.2 Ω | RN022R2ZU001 |
| R1262 | CHIP RES. 1/10W J 680 Ω | RRXAJR5Z0681 |
| R1263 | CHIP RES. 1/10W J 39k Ω | RRXAJR5Z0393 |
| R1264 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1267 | CHIP RES. 1/10W J 82k Ω | RRXAJR5Z0823 |
| R1270 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1273 | CHIP RES. 1/10W J 1.8k Ω | RRXAJR5Z0182 |
| R1274 | CHIP RES. 1/10W J 1.5k Ω | RRXAJR5Z0152 |
| R1277 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1280 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1283 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1284 | CHIP RES. 1/10W J 220k Ω | RRXAJR5Z0224 |
| R1285 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1286 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1287 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R1289 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1290 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1291 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1292 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1293 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1294 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1298 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1299 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1405 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1406 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1407 | CHIP RES. 1/10W J 18k Ω | RRXAJR5Z0183 |
| R1408 | CHIP RES. 1/10W J 18k Ω | RRXAJR5Z0183 |
| R1409 | CHIP RES. 1/10W J 6.8k Ω | RRXAJR5Z0682 |
| R1410 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1411 | CHIP RES. 1/10W J 220 Ω | RRXAJR5Z0221 |
| R1412 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1413 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1415 | CHIP RES. 1/10W J 1.2k Ω | RRXAJR5Z0122 |
| R1416 | CHIP RES. 1/10W J 330k Ω | RRXAJR5Z0334 |
| R1417 | CHIP RES. 1/10W J 220 Ω | RRXAJR5Z0221 |
| R1418 | CHIP RES. 1/10W J 330 Ω | RRXAJR5Z0331 |
| R1419 | CHIP RES. 1/10W J 330 Ω | RRXAJR5Z0331 |
| R1420 | CHIP RES. 1/10W J 12k Ω | RRXAJR5Z0123 |
| R1421 | CHIP RES. 1/10W J 8.2k Ω | RRXAJR5Z0822 |
| R1422 | CHIP RES. 1/10W J 270 Ω | RRXAJR5Z0271 |
| R1423 | CHIP RES. 1/10W J 390 Ω | RRXAJR5Z0391 |
| R1424 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1425 | CHIP RES. 1/10W J 82k Ω | RRXAJR5Z0823 |
| R1426 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1427 | CHIP RES. 1/10W J 820 Ω | RRXAJR5Z0821 |
| R1428 | CHIP RES. 1/10W J 680k Ω | RRXAJR5Z0684 |
| R1429 | CHIP RES. 1/10W J 1.2k Ω | RRXAJR5Z0122 |
| R1431 | CHIP RES. 1/10W J 8.2k Ω | RRXAJR5Z0822 |
| R1432 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1437 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1438 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1602⚠ | CEMENT RES 5W K 1.2 Ω | RW051R2PG002 |
| R1603⚠ | METAL OXIDE FILM RES. 2W J 0.33 Ω | RN02R33ZU001 |
| R1604 | CARBON RES. 1/4W J 560k Ω | RCX4JATZ0564 |
| R1605 | CARBON RES. 1/4W J 560k Ω | RCX4JATZ0564 |
| R1606 | CARBON RES. 1/4W J 220 Ω | RCX4JATZ0221 |
| R1607 | CARBON RES. 1/4W J 220 Ω | RCX4JATZ0221 |
| R1608 | CARBON RES. 1/4W J 180k Ω | RCX4JATZ0184 |
| R1609 | CARBON RES. 1/4W J 10 Ω | RCX4JATZ0100 |

| Ref. No. | Description | Part No. |
|---|---|---|
| R1610 | CARBON RES. 1/4W J 1.2k Ω | RCX4JATZ0122 |
| R1613 | CARBON RES. 1/4W J 150 Ω | RCX4JATZ0151 |
| R1614 | CARBON RES. 1/4W J 1.2k Ω | RCX4JATZ0122 |
| R1617⚠ | CARBON RES. 1/4W J 180 Ω | RCX4JATZ0181 |
| R1618⚠ | PCB JUMPER D0.6-P5.0 | JW5.0T |
| R1619⚠ | METAL OXIDE FILM RES. 1W J 2.2k Ω | RN01222ZU001 |
| R1620⚠ | METAL OXIDE FILM RES. 1W J 2.2k Ω | RN01222ZU001 |
| R1621 | METAL OXIDE FILM RES. 1W J 4.7k Ω | RN01472ZU001 |
| R1623⚠ | CARBON RES. 1/4W J 33k Ω | RCX4JATZ0333 |
| R1624⚠ | CARBON RES. 1/4W G 47k Ω | RCX4GATZ0473 |
| R1625⚠ | CARBON RES. 1/4W G 39k Ω | RCX4GATZ0393 |
| R1629⚠ | CARBON RES. 1/4W J 13k Ω | RCX4JATZ0133 |
| R1630⚠ | CARBON RES. 1/4W J 13k Ω | RCX4JATZ0133 |
| R1631⚠ | CARBON RES. 1/4W J 12k Ω | RCX4JATZ0123 |
| R1632⚠ | CARBON RES. 1/4W G 560 Ω | RCX4GATZ0561 |
| R1633⚠ | CARBON RES. 1/4W G 5.6k Ω | RCX4GATZ0562 |
| R1634 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1635 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R1636⚠ | METAL OXIDE FILM RES. 1W J 2.2k Ω | RN01222ZU001 |
| R1637⚠ | PCB JUMPER D0.6-P5.0 | JW5.0T |
| R1639 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1640 | CARBON RES. 1/4W J 100 Ω | RCX4JATZ0101 |
| R1642⚠ | CHIP RES. 1/10W J 6.8k Ω | RRXAJR5Z0682 |
| R1644 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1650 | METAL OXIDE FILM RES. 1W J 4.7k Ω | RN01472ZU001 |
| R1654 | CARBON RES. 1/4W J 5.6 Ω | RCX4JATZ05R6 |
| R1655 | CARBON RES. 1/4W J 2.7k Ω | RCX4JATZ0272 |
| R1656 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| R1657 | CARBON RES. 1/4W J 2.7 Ω | RCX4JATZ02R7 |
| R1662⚠ | CARBON RES. 1/4W J 560k Ω | RCX4JATZ0564 |
| R1663 | CARBON RES. 1/4W J 560k Ω | RCX4JATZ0564 |
| R1685 | METAL OXIDE FILM RES. 1W J 8.2 Ω | RN018R2ZU001 |
| R1686 | CARBON RES. 1/4W J 150 Ω | RCX4JATZ0151 |
| R1687 | CARBON RES. 1/4W J 150 Ω | RCX4JATZ0151 |
| R1688 | CARBON RES. 1/2W J 12 Ω | RCX2JZQZ0120 |
| R1689 | CARBON RES. 1/4W J 5.6 Ω | RCX4JATZ05R6 |
| R1691 | CARBON RES. 1/4W J 8.2 Ω | RCX4JATZ08R2 |
| R1692 | CARBON RES. 1/2W J 18 Ω | RCX2JZQZ0180 |
| R1693 | CARBON RES. 1/2W J 18 Ω | RCX2JZQZ0180 |
| R1694 | CARBON RES. 1/4W J 1.5 Ω | RCX4JATZ01R5 |
| R1701 | CHIP RES. 1/10W J 75 Ω | RRXAJR5Z0750 |
| R1751 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1752 | CHIP RES. 1/10W J 12k Ω | RRXAJR5Z0123 |
| R1753 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1754 | CHIP RES. 1/10W J 8.2k Ω | RRXAJR5Z0822 |
| R1755 | CHIP RES. 1/10W J 470 Ω | RRXAJR5Z0471 |
| R1756 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1757 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1758 | CHIP RES. 1/10W J 8.2k Ω | RRXAJR5Z0822 |
| R1759 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1760 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1761 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1762 | CHIP RES. 1/10W J 8.2k Ω | RRXAJR5Z0822 |
| R1763 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1764 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1765 | CHIP RES. 1/10W J 8.2k Ω | RRXAJR5Z0822 |
| R1769 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1772 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1773 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1774 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1780 | CHIP RES. 1/10W J 6.8k Ω | RRXAJR5Z0682 |
| R1781 | CHIP RES. 1/10W J 8.2k Ω | RRXAJR5Z0822 |
| R1801⚠ | CARBON RES. 1/4W J 180 Ω | RCX4JATZ0181 |

| Ref. No. | Description | Part No. |
|---|---|---|
| R1802⚠ | CARBON RES. 1/4W J 180 Ω | RCX4JATZ0181 |
| R1803⚠ | METAL OXIDE FILM RES. 1W J 18 Ω | RN01180ZU001 |
| R1804 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1805 | CHIP RES. 1/10W J 1.8k Ω | RRXAJR5Z0182 |
| R1806 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1807 | CHIP RES. 1/10W J 1.8k Ω | RRXAJR5Z0182 |
| R1808⚠ | METAL OXIDE FILM RES. 1W J 18 Ω | RN01180ZU001 |
| R1809 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1810 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1813 | CHIP RES. 1/10W J 18k Ω | RRXAJR5Z0183 |
| R1814 | CHIP RES. 1/10W J 18k Ω | RRXAJR5Z0183 |
| R1815 | CHIP RES. 1/10W J 33k Ω | RRXAJR5Z0333 |
| R1816 | CHIP RES. 1/10W J 33k Ω | RRXAJR5Z0333 |
| R1850 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1851 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1852 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1853 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1854 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1855 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1856 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1857 | CHIP RES. 1/10W J 100k Ω | RRXAJR5Z0104 |
| R1858 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1859 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1860 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R1871 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R1872 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R1873 | CHIP RES. 1/10W J 18k Ω | RRXAJR5Z0183 |
| R1874 | CARBON RES. 1/4W J 100 Ω | RCX4JATZ0101 |
| R1875 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1876 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R1877 | CARBON RES. 1/4W J 820 Ω | RCX4JATZ0821 |
| R1901 | CHIP RES. 1/10W J 5.6k Ω | RRXAJR5Z0562 |
| R1902 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1903 | CHIP RES. 1/10W J 3.9k Ω | RRXAJR5Z0392 |
| R1904 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R1905 | CHIP RES. 1/10W J 3.3 Ω | RRXAJR5Z03R3 |
| R1907 | CARBON RES. 1/4W J 1.2k Ω | RCX4JATZ0122 |
| R1908 | CHIP RES. 1/10W J 1.5k Ω | RRXAJR5Z0152 |
| R1909 | CHIP RES. 1/10W F 3.9k Ω | RRXAFR5H3901 |
| R1910 | CHIP RES. 1/10W F 560 Ω | RRXAFR5H5600 |
| R1911 | CHIP RES. 1/10W F 8.2k Ω | RRXAFR5H8201 |
| R1913 | CARBON RES. 1/4W J 180 Ω | RCX4JATZ0181 |
| R1914 | CARBON RES. 1/4W J 560 Ω | RCX4JATZ0561 |
| R1915⚠ | METAL OXIDE FILM RES. 1W J 1.2 Ω | RN011R2ZU001 |
| R1916 | CARBON RES. 1/4W J 39k Ω | RCX4JATZ0393 |
| R1917 | CARBON RES. 1/4W J 22k Ω | RCX4JATZ0223 |
| R1919 | CARBON RES. 1/4W J 680 Ω | RCX4JATZ0681 |
| R1920 | CARBON RES. 1/4W J 1M Ω | RCX4JATZ0105 |
| R1921 | CARBON RES. 1/4W J 1M Ω | RCX4JATZ0105 |
| R1923⚠ | CARBON RES. 1/4W J 22k Ω | RCX4JATZ0223 |
| R1924 | CARBON RES. 1/4W J 22k Ω | RCX4JATZ0223 |
| R1925 | CARBON RES. 1/4W J 22k Ω | RCX4JATZ0223 |
| R1926 | CARBON RES. 1/4W J 15k Ω | RCX4JATZ0153 |
| R1927 | CHIP RES. 1/10W J 18k Ω | RRXAJR5Z0183 |
| R1928 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R1929 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| **SWITCHES** | | |
| SW1201 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1202 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1203 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1206 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1207 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1208 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1209 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1210 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW1211 | LEAF SWITCH LSA-1142-2AU | SSC0101KB014 |
| SW1212 | SWITCH ROTARY SSS-53MD-1 | SSR0106KB004 |
| **MISCELLANEOUS** | | |
| BC1001 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| BC1100 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| BC1600 | BEADS INDUCTOR FBR07HA121SB-00 | LLBF00STU030 |
| BC1606 | BEADS INDUCTOR FBR07HA121SB-00 | LLBF00STU030 |
| CF1032 | CERAMIC SIF FILTER EFCS4R5YS8P | FBB455LMS001 |
| CL1201 | FMN CONNECTOR TOP 12P 12FMN-BTRK-A(LF)(SN) | JCFNG12JG020 |
| F1601⚠ | FUSE 4.00A/125V | PAGG20CNG402 |
| FH1601 | FUSE HOLDER MSF-015 LF (B110) | XH01Z00LY002 |
| FH1602 | FUSE HOLDER MSF-015 LF (B110) | XH01Z00LY002 |
| JK1701 | RCA JACK(YELLOW) (PB FREE) AV-3B-54H | JXRL010SNJ01 |
| JK1702 | RCA JACK(WHITE) MTJ-032-05B-22(B110) | JXRL010LY136 |
| JK1703 | RCA JACK(RED) (PB FREE) AV-3A-57H | JYRL010SNJ01 |
| JK1801 | MINIATURE JACK(PB FREE) CKX-035-318AZ4 | JYSL010SNJ01 |
| PS1601⚠ | THERMISTOR ZPB45BL3R0A | QNBZ45BL3R0A |
| RS1201 | SENSOR REMOTE RECEIVER KSM-602LU2S | USESJRSKK048 |
| SA1601⚠ | SURGE ABSORBER 470V+-10PER | NVQZ10D471KB |
| SF1001 | FILTER CERAMIC BAND PASS SAFHS45M7VAJZ00B05 | FBB456LMR004 |
| SG1601⚠ | GAP. FNR-G3.10D | FAZ000LD6005 |
| T1601⚠ | TRANS POWER BCK-35-0396 | LTT3PC0XB013 |
| T1901⚠ | TRANS POWER BCK-25-0127 | LTT2PC0XB014 |
| TB3 | HEAD SHIELD T1200UA | 1EM321250 |
| TB8 | BUSH LED(F) H3700UD | 0VM409508 |
| TB9 | MODULE HEAT SINK PMC P7150UT | 1EM423968 |
| TB10 | X8 MAIN HEAT SINK PLY ASSEMBLY P7750UM | 1EM423970 |
| TL2 | SCREW B-TIGHT D3X8 BIND HEAD+ | GBJB3080 |
| TP1202 | PCB JUMPER D0.6-P21.0 | JW21.0T |
| TP1401 | PCB JUMPER D0.6-P24.0 | JW24.0T |
| TP1402 | PCB JUMPER D0.6-P22.0 | JW22.0T |
| TP1403 | PCB JUMPER D0.6-P22.0 | JW22.0T |
| TP1703 | PCB JUMPER D0.6-P7.5 | JW7.5T |
| TU1010 | TUNER UNIT ENV56M07D8F | UTUNATSMS001 |
| W1601⚠ | AC CORD (PB FREE) A0A0280-014 | WAC0172LTE14 |
| VR1601⚠ | CARBON P.O.T. VZ067TL1 B103 PB(F) | VRCB103HH014 |
| X1201 | XTAL DT38 32.768kHz | FX0323LDS001 |
| X1202 | XTAL HC-49/U 10.6MHz | FXD106LLN001 |
| X1401 | XTAL 3.579545MHz(20PPM) | FXC355LLN004 |

## SENSOR CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | SENSOR CBA<br>Consists of the following: | 1ESA12193 |
| **TRANSISTORS** | | |
| Q1201 | PHOTO TRANSISTOR MID-32A22F | NPWZ1D32A22F |
| Q1202 | PHOTO TRANSISTOR MID-32A22F | NPWZ1D32A22F |

## MPS CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | MPS CBA<br>Consists of the following: | 1ESA14054 |
| | SUB CBA (MPS-A)<br>CRT CBA (MPS-B)<br>FUNCTION CBA (MPS-C)<br>JUNCTION-A CBA<br>JUNCTION-B CBA | ---------<br>---------<br>---------<br>---------<br>--------- |

## SUB CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | SUB CBA (MPS-A)<br>Consists of the following: | ---------- |
| | **CAPACITORS** | |
| C2305 | ELECTROLYTIC CAP. 470µF/10V M | CE1AMASDL471 |
| C2307 | CHIP CERAMIC CAP.(1608) B K 0.01µF/50V | CHD1JK30B103 |
| C2308 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2309 | CHIP CERAMIC CAP.(1608) B K 0.01µF/50V | CHD1JK30B103 |
| C2310 | STACKED FILM CAP. 0.47µF/50V J | CMA1JJS00474 |
| C2311 | ELECTROLYTIC CAP. 220µF/10V M | CE1AMASDL221 |
| C2315 | CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V | CHD1EZ30F104 |
| C2316 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2317 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2318 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2320 | ELECTROLYTIC CAP. 100µF/10V M | CE1AMASDL101 |
| C2321 | ELECTROLYTIC CAP. 22µF/50V M | CE1JMASDL220 |
| C2322 | ELECTROLYTIC CAP. 0.47µF/50V M | CE1JMASDLR47 |
| C2323 | CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V | CHD1EZ30F104 |
| C2324 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2326 | CHIP CERAMIC CAP.(1608) B K 0.01µF/50V | CHD1JK30B103 |
| C2327 | CHIP CERAMIC CAP.(1608) CH J 100pF/50V | CHD1JJ3CH101 |
| C2328 | CHIP CERAMIC CAP.(1608) CH J 100pF/50V | CHD1JJ3CH101 |
| C2330 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2331 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2332 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2333 | CHIP CERAMIC CAP. F Z 1µF/10V | CHD1AZ30F105 |
| C2334 | ELECTROLYTIC CAP. 1µF/50V M | CE1JMASDL1R0 |
| C2531 | METALIZED FILM CAP. 0.27µF/200V J | CT2D274F7003 |
| C2533⚠ | P.P. CAP 0.0082µF/1.6K J | CA3C822VC011 |
| C2552 | FILM CAP.(P) 0.22µF/100V J | CMA2AJS00224 |
| C2553 | ELECTROLYTIC CAP. 2.2µF/50V LL | CE1JMASLH2R2 |
| C2555 | ELECTROLYTIC CAP. 47µF/35V M | CE1GMASDL470 |
| C2556 | ELECTROLYTIC CAP. 1000µF/25V M | CE1EMZPDL102 |
| C2559 | ELECTROLYTIC CAP. 220µF/35V M | CE1GMASDL221 |
| C2560 | FILM CAP.(P) 0.033µF/50V J | CMA1JJS00333 |
| C2574 | ELECTROLYTIC CAP. 4.7µF/250V M | CE2EMASDL4R7 |
| C2577 | FILM CAP.(P) 0.022µF/50V J | CMA1JJS00223 |
| C2578 | ELECTROLYTIC CAP. 47µF/35V M | CE1GMASDL470 |
| C2583 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| C2584⚠ | ELECTROLYTIC CAP. 1µF/160V M | CE2CMASDL1R0 |
| C2585 | CERAMIC CAP. B K 100pF/500V | CCD2JKS0B101 |
| C2586 | ELECTROLYTIC CAP. 4.7µF/50V M | CE1JMASDL4R7 |
| C2590 | CHIP CERAMIC CAP. F Z 0.01µF/50V | CHD1JZ30F103 |
| C2592 | ELECTROLYTIC CAP. 47µF/25V M | CE1EMASDL470 |
| C2594 | ELECTROLYTIC CAP. 47µF/160V M W/F | CE2CMZNDL470 |
| C2595⚠ | CERAMIC CAP. 1200pF/2KV | CA3D122PAN04 |
| C2596 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| C2601 | CHIP CERAMIC CAP.(1608) F Z 0.1µF/25V | CHD1EZ30F104 |
| C2603 | ELECTROLYTIC CAP. 1000µF/6.3V M | CE0KMASDL102 |
| C2605 | CHIP CERAMIC CAP.(1608) CH J 100pF/50V | CHD1JJ3CH101 |
| C2606 | CHIP CERAMIC CAP.(1608) CH J 100pF/50V | CHD1JJ3CH101 |
| C2609 | ELECTROLYTIC CAP. 47µF/50V M | CE1JMASDL470 |
| C2616 | ELECTROLYTIC CAP. 100µF/6.3V M | CE0KMASDL101 |
| C2629 | ELECTROLYTIC CAP. 220µF/6.3V M | CE0KMASDL221 |
| C2630 | ELECTROLYTIC CAP. 470µF/16V M | CE1CMASDL471 |
| C2670 | ELECTROLYTIC CAP. 470µF/6.3V M | CE0KMASDL471 |
| | **CONNECTORS** | |
| CN2103 | TWG CONNECTOR 19P TWG-P19P-A1 | J3TWA19TG001 |
| CN2301 | TWG CONNECTOR 19P TWG-P19P-A1 | J3TWA19TG001 |
| CN2302 | TWG CONNECTOR 19P TWG-P19P-A1 | J3TWA19TG001 |
| CN2571⚠ | CONNECTOR PRINT OSU 5P RTB-1.5-5P (LF) | J3RTC05JG002 |

| Ref. No. | Description | Part No. |
|---|---|---|
| | **DIODES** | |
| D2300 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2301 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2302 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2304 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2305 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2307 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2308 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2552⚠ | DIODE FR104-B | NDLZ000FR104 |
| D2571 | FAST RECOVERY DIODE FR202 | NDWZ000FR202 |
| D2572⚠ | DIODE FR104-B | NDLZ000FR104 |
| D2575⚠ | ZENER DIODE MTZJT-7710B | QDTB00MTZJ10 |
| D2584 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2585 | ZENER DIODE MTZJT-775.1B | QDTB0MTZJ5R1 |
| D2586 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| D2591⚠ | ZENER DIODE MTZJT-7736B | QDTB00MTZJ36 |
| D2595⚠ | ZENER DIODE MTZJT-7722C | QDTC00MTZJ22 |
| D2596⚠ | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2597 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2598⚠ | DIODE FR104-B | NDLZ000FR104 |
| D2599 | CARBON RES. 1/4W J 22k Ω | RCX4JATZ0223 |
| D2603⚠ | ZENER DIODE MTZJT-775.6C | QDTC0MTZJ5R6 |
| D2618 | ZENER DIODE MTZJT-773.9A | QDTA0MTZJ3R9 |
| D2627 | ZENER DIODE MTZJT-773.9B | QDTB0MTZJ3R9 |
| D2651 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2652 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2661 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2662 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| | **ICS** | |
| IC2301⚠ | VCD IC M61276FP TF0H | QSZAB0RMB134 |
| IC2551⚠ | VERTICAL OUTPUT IC LA78040A | QSBBA0SSY003 |
| IC2602⚠ | VOLTAGE REGULATOR TLV1117IDCYRG3 | NSZBA0TTY219 |
| IC3603 | IC SHUNT REGULATOR KIA431-AT/P | NSZBA0TJY036 |
| | **COILS** | |
| L2505 | CHOKE COIL 22µH-K | LLBD00PKV021 |
| L2613 | INDUCTOR 10µH-K-5FT | LLARKBSTU100 |
| | **TRANSISTORS** | |
| Q2304⚠ | NPN TRANSISTOR 2SC1627-Y (TE2.F.T) | QQSY2SC1627F |
| Q2305⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q2571⚠ | TRANSISTOR 2SC5885000RF | QQZZ02SC5885 |
| Q2591⚠ | NPN TRANSISTOR 2SC1627-Y (TE2.F.T) | QQSY2SC1627F |
| Q2592⚠ | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q2601 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q2608 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q2609 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q2610⚠ | TRANSISTOR KTA1267-GR-AT/P | NQS1KTA1267P |
| Q2611⚠ | TRANSISTOR KTC3199-Y-AT/P | NQSYKTC3199P |
| Q2612 | TRANSISTOR KTC3199-GR-AT/P | NQS4KTC3199P |
| Q2615⚠ | TRANSISTOR 2SD400(F) | QQUF002SD400 |
| Q2616 | NPN TRANSISTOR KRC103M-AT/P | NQSZKRC103MP |
| Q2617⚠ | TRANSISTOR KTC3199-Y-AT/P | NQSYKTC3199P |
| Q2618⚠ | TRANSISTOR 2SA950-O (TE2 F T) | QQS002SA950F |
| | **RESISTORS** | |
| R2301 | CHIP RES. 1/10W J 330 Ω | RRXAJR5Z0331 |
| R2303 | CHIP RES. 1/10W J 330 Ω | RRXAJR5Z0331 |
| R2305 | CHIP RES. 1/10W J 330 Ω | RRXAJR5Z0331 |
| R2306 | CHIP RES. 1/10W J 5.6k Ω | RRXAJR5Z0562 |
| R2307 | CHIP RES. 1/10W J 470 Ω | RRXAJR5Z0471 |
| R2309 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R2310 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R2311 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R2319 | CHIP RES. 1/10W J 15k Ω | RRXAJR5Z0153 |

| Ref. No. | Description | Part No. |
|---|---|---|
| R2321 | CARBON RES. 1/4W J 470 Ω | RCX4JATZ0471 |
| R2322 | CARBON RES. 1/4W J 33 Ω | RCX4JATZ0330 |
| R2323 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R2324 | CHIP RES. 1/10W J 3.3k Ω | RRXAJR5Z0332 |
| R2325 | CHIP RES. 1/10W J 3.3M Ω | RRXAJR5Z0335 |
| R2326 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R2327 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R2328 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R2331 | CHIP RES. 1/10W J 180k Ω | RRXAJR5Z0184 |
| R2332 | CHIP RES. 1/10W J 120k Ω | RRXAJR5Z0124 |
| R2333 | CARBON RES. 1/4W J 18 Ω | RCX4JATZ0180 |
| R2501 | CHIP RES. 1/10W J 39k Ω | RRXAJR5Z0393 |
| R2504 | CHIP RES. 1/10W J 15k Ω | RRXAJR5Z0153 |
| R2505 | METAL OXIDE FILM RES. 2W J 1k Ω | RN02102ZU001 |
| R2506 | METAL OXIDE FILM RES. 2W J 1k Ω | RN02102ZU001 |
| R2541 | CARBON RES. 1/4W J 3.3k Ω | RCX4JATZ0332 |
| R2550 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| R2551 | CHIP RES. 1/10W J 1.5k Ω | RRXAJR5Z0152 |
| R2552 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| R2555 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R2556 | CARBON RES. 1/4W J 1 Ω | RCX4JATZ01R0 |
| R2557 | CHIP RES. 1/10W J 10k Ω | RRXAJR5Z0103 |
| R2558 | CHIP RES. 1/10W J 12k Ω | RRXAJR5Z0123 |
| R2559 | CHIP RES.(1608) 1/10W 0 Ω | RRXAJR5Z0000 |
| R2560 | CHIP RES. 1/10W J 2.7k Ω | RRXAJR5Z0272 |
| R2561 | CHIP RES. 1/10W J 3.9k Ω | RRXAJR5Z0392 |
| R2562 | CARBON RES. 1/4W J 6.8 Ω | RCX4JATZ06R8 |
| R2563 | CARBON RES. 1/4W J 6.8 Ω | RCX4JATZ06R8 |
| R2564 | CARBON RES. 1/4W J 6.8 Ω | RCX4JATZ06R8 |
| R2565 | CARBON RES. 1/4W J 5.6k Ω | RCX4JATZ0562 |
| R2566 | CARBON RES. 1/4W J 5.6k Ω | RCX4JATZ0562 |
| R2571 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R2572 | CARBON RES. 1/4W J 1k Ω | RCX4JATZ0102 |
| R2573 | CARBON RES. 1/4W J 1k Ω | RCX4JATZ0102 |
| R2576 | CARBON RES. 1/4W J 180 Ω | RCX4JATZ0181 |
| R2577 | CARBON RES. 1/4W J 180 Ω | RCX4JATZ0181 |
| R2580⚠ | CARBON RES. 1/4W J 33 Ω | RCX4JATZ0330 |
| R2581 | CHIP RES. 1/10W J 470 Ω | RRXAJR5Z0471 |
| R2583⚠ | METAL RESISTER. 2W J 2.7 Ω | RN022R7ZU001 |
| R2584 | CARBON RES. 1/4W J 1k Ω | RCX4JATZ0102 |
| R2585 | CHIP RES. 1/10W J 4.7k Ω | RRXAJR5Z0472 |
| R2586 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| R2587 | CARBON RES. 1/4W J 100k Ω | RCX4JATZ0104 |
| R2588 | CARBON RES. 1/4W J 100k Ω | RCX4JATZ0104 |
| R2589⚠ | CARBON RES. 1/4W J 27 Ω | RCX4JATZ0270 |
| R2590⚠ | CARBON RES. 1/4W J 27 Ω | RCX4JATZ0270 |
| R2591 | CARBON RES. 1/4W J 22k Ω | RCX4JATZ0223 |
| R2592⚠ | CARBON RES. 1/4W G 180k Ω | RCX4GATZ0184 |
| R2593⚠ | CARBON RES. 1/4W G 82k Ω | RCX4GATZ0823 |
| R2594 | CARBON RES. 1/4W G 56k Ω | RCX4GATZ0563 |
| R2599 | CHIP RES. 1/10W J 5.6k Ω | RRXAJR5Z0562 |
| R2601 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R2602 | CHIP RES. 1/10W J 560 Ω | RRXAJR5Z0561 |
| R2603 | CHIP RES. 1/10W J 2.2k Ω | RRXAJR5Z0222 |
| R2604 | CHIP RES. 1/10W J 2k Ω | RRXAJR5Z0202 |
| R2607 | CARBON RES. 1/4W J 220 Ω | RCX4JATZ0221 |
| R2608 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R2609 | CARBON RES. 1/4W J 220 Ω | RCX4JATZ0221 |
| R2610 | CARBON RES. 1/4W J 75 Ω | RCX4JATZ0750 |
| R2611 | CHIP RES. 1/10W J 100 Ω | RRXAJR5Z0101 |
| R2613 | CARBON RES. 1/4W J 1 Ω | RCX4JATZ01R0 |
| R2617 | CARBON RES. 1/4W J 390 Ω | RCX4JATZ0391 |
| R2618 | CARBON RES. 1/4W J 390 Ω | RCX4JATZ0391 |
| R2649⚠ | CARBON RES. 1/4W J 5.6 Ω | RCX4JATZ05R6 |
| R2650 | CARBON RES. 1/4W J 1.2 Ω | RCX4JATZ01R2 |
| R2651 | CHIP RES. 1/10W J 47k Ω | RRXAJR5Z0473 |
| R2653 | CARBON RES. 1/4W J 33 Ω | RCX4JATZ0330 |
| R2655 | CHIP RES. 1/10W J 220 Ω | RRXAJR5Z0221 |
| R2656 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R2657 | CHIP RES. 1/10W J 22k Ω | RRXAJR5Z0223 |
| R2658 | CHIP RES. 1/10W J 1k Ω | RRXAJR5Z0102 |
| R2659 | CARBON RES. 1/4W J 820 Ω | RCX4JATZ0821 |
| R2660 | CARBON RES. 1/4W J 820 Ω | RCX4JATZ0821 |
| R2675 | CHIP RES. 1/10W J 150 Ω | RRXAJR5Z0151 |
| R2676 | CHIP RES. 1/10W J 82k Ω | RRXAJR5Z0823 |
| R2677 | METAL OXIDE FILM RES. 1/2W J 0.47 Ω | RNX2JZPZ0R47 |
| R2678 | CHIP RES. 1/10W J 220 Ω | RRXAJR5Z0221 |
| R2680 | RES CHIP.(1608) 1/10W J 0.30 Ω | RRXAR30HH007 |
| R2681 | RES CHIP.(1608) 1/10W J 0.30 Ω | RRXAR30HH007 |
| R2686 | CARBON RES. 1/4W J 330 Ω | RCX4JATZ0331 |
| R2687 | CHIP RES. 1/10W F 5.6k Ω | RRXAFR5H5601 |
| R2688 | CHIP RES. 1/10W F 15k Ω | RRXAFR5H1502 |
| R2691 | CARBON RES. 1/4W J 1 Ω | RCX4JATZ01R0 |
| R2692 | CHIP RES. 1/10W J 130 Ω | RRXAJR5Z0131 |
| R2693 | CHIP RES. 1/10W J 130 Ω | RRXAJR5Z0131 |
| R3521⚠ | METAL OXIDE FILM RES. 1W J 10 Ω | RN01100ZU001 |
| R3568⚠ | CARBON RES. 1/4W J 3.3 Ω | RCX4JATZ03R3 |
| R3576 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| R3580⚠ | CARBON RES. 1/4W J 33 Ω | RCX4JATZ0330 |
| | **MISCELLANEOUS** | |
| BC2501 | BEAD INDUCTOR FBA04HA600VB-00 | LLBF00STU026 |
| CL2501 | LEAD WIRE 3P 420MM | WX1T1000-001 |
| CL2504 | LEAD WIRE 5P 330MM | WX1T2120-001 |
| JK2601 | JACK RCA PCB L MSP-241V-05 NI LFW/O | JXRL010LY148 |
| T2571⚠ | TRANS FBT JF0501-3201A-G | LTF00CPXB048 |
| T2572⚠ | HORIZONTAL DRIVE TRANS LP2-005 | LTH00CPA5005 |
| TB11 | X8 H/V HEAT SINK PLZ P7750UM | 1EM423971 |
| TL2 | SCREW B-TIGHT D3X8 BIND HEAD+ | GBJB3080 |
| TP1301 | PCB JUMPER D0.6-P7.5 | JW7.5T |
| TP1302 | PCB JUMPER D0.6-P7.5 | JW7.5T |
| TP1303 | PCB JUMPER D0.6-P7.5 | JW7.5T |
| TP2501 | PCB JUMPER D0.6-P10.0 | JW10.0T |
| TP2502 | PCB JUMPER D0.6-P27.5 | JW27.5T |
| TP2503 | PCB JUMPER D0.6-P14.0 | JW14.0T |
| TP2504 | PCB JUMPER D0.6-P18.0 | JW18.0T |
| TP2505 | PCB JUMPER D0.6-P14.0 | JW14.0T |
| TP2506 | PCB JUMPER D0.6-P11.0 | JW11.0T |
| X2301 | XTAL 3.579545 MHz | FXD355LLN003 |

## CRT CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | CRT CBA (MPS-B)<br>Consists of the following: | ---------- |
| | **CAPACITORS** | |
| C2504 | CERAMIC CAP.(AX) B J 390pF/50V | CCA1JJT0B391 |
| C2505 | CERAMIC CAP.(AX) B J 330pF/50V | CCA1JJT0B331 |
| C2506 | CERAMIC CAP.(AX) B J 330pF/50V | CCA1JJT0B331 |
| C2508 | ELECTROLYTIC CAP. 47μF/25V M | CE1EMASDL470 |
| C2509⚠ | CERAMIC CAP. B K 1000pF/2KV | CCD3DKP0B102 |
| | **CONNECTOR** | |
| CN2501 | CONNECTOR PIN 1P RT-01N-2.3A | 1730688 |
| | **DIODES** | |
| D2501 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2502 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |
| D2503 | SWITCHING DIODE 1SS133(T-77) | QDTZ001SS133 |

| Ref. No. | Description | Part No. |
|---|---|---|
| D2505 | PCB JUMPER D0.6-P5.0 | JW5.0T |
| | **COIL** | |
| L2501 | INDUCTOR 180μH-J-5FT | LLARJCSTU181 |
| | **TRANSISTORS** | |
| Q2501⚠ | NPN TRANSISTOR 2SC2482(T6FUNAIF M | QRSZ2SC2482F |
| Q2502⚠ | NPN TRANSISTOR 2SC2482(T6FUNAIF M | QRSZ2SC2482F |
| Q2503⚠ | NPN TRANSISTOR 2SC2482(T6FUNAIF M | QRSZ2SC2482F |
| | **RESISTORS** | |
| R2502 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| R2503 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| R2507 | CHIP RES. 1/10W J 33 Ω | RRXAJR5Z0330 |
| R2508 | CHIP RES. 1/10W J 33 Ω | RRXAJR5Z0330 |
| R2509 | CHIP RES. 1/10W J 33 Ω | RRXAJR5Z0330 |
| R2510 | CARBON RES. 1/4W J 5.6k Ω | RCX4JATZ0562 |
| R2511 | CARBON RES. 1/4W J 5.6k Ω | RCX4JATZ0562 |
| R2512 | CARBON RES. 1/4W J 5.6k Ω | RCX4JATZ0562 |
| R2513 | CARBON RES. 1/4W J 560 Ω | RCX4JATZ0561 |
| R2514 | CARBON RES. 1/4W J 560 Ω | RCX4JATZ0561 |
| R2515 | CARBON RES. 1/4W J 560 Ω | RCX4JATZ0561 |
| R2516⚠ | METAL OXIDE FILM RES. 1W J 15k Ω | RN01153DP003 |
| R2517⚠ | METAL OXIDE FILM RES. 1W J 15k Ω | RN01153DP003 |
| R2518⚠ | METAL OXIDE FILM RES. 1W J 15k Ω | RN01153DP003 |
| R2519 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| R2520 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| R2521 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| R2523 | CARBON RES. 1/4W J 1.5k Ω | RCX4JATZ0152 |
| | **MISCELLANEOUS** | |
| JK2501⚠ | CRT SOCKET ISMP02S | JSCC220PK009 |

## FUNCTION CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | FUNCTION CBA (MPS-C)<br>Consists of the following: | ---------- |
| | **CONNECTORS** | |
| CN2401 | BOARD CONNECTOR 07P(PB FREE)<br>127301107K2 | JCTWA07TG004 |
| CN2801 | 242 SERIES CONNECTOR 224202104W1 | J322C04TG001 |
| | **RESISTORS** | |
| R2401 | CHIP RES. 1/10W F 1.5k Ω | RRXAFR5H1501 |
| R2402 | CHIP RES. 1/10W F 1.5k Ω | RRXAFR5H1501 |
| R2403 | CHIP RES. 1/10W F 2.2k Ω | RRXAFR5H2201 |
| R2404 | CHIP RES. 1/10W F 2.7k Ω | RRXAFR5H2701 |
| R2405 | CHIP RES. 1/10W F 4.7k Ω | RRXAFR5H4701 |
| R2406 | CHIP RES. 1/10W F 6.8k Ω | RRXAFR5H6801 |
| R2407 | CHIP RES. 1/10W F 15k Ω | RRXAFR5H1502 |
| | **SWITCHES** | |
| SW2401 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW2402 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW2403 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW2404 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW2405 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW2406 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW2407 | TACT SWITCH SKQSAB | SST0101AL038 |
| SW2408 | TACT SWITCH SKQSAB | SST0101AL038 |

## JUNCTION-A CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | JUNCTION-A CBA<br>Consists of the following: | ---------- |
| | **CONNECTOR** | |
| CN3802 | 242 SERIES CONNECTOR TUC-P04X-B1 WHT ST | JCTUB04TG002 |
| | **MISCELLANEOUS** | |
| CL3802 | WIRE ASSEMBLY 2P 180MM | WX1T9200-005 |

## JUNCTION-B CBA

| Ref. No. | Description | Part No. |
|---|---|---|
| | JUNCTION-B CBA<br>Consists of the following: | ---------- |
| | **CONNECTOR** | |
| CN3801 | 242 SERIES CONNECTOR TUC-P04X-B1 WHT ST | JCTUB04TG002 |
| | **MISCELLANEOUS** | |
| CL3801 | WIRE ASSEMBLY 2P 180MM | WX1T9200-005 |

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